

MINING WORLD

SMALL
MINES'
REVIEW

JANUARY, 1951

VOL. 13 No. 1

35 cents a copy
in stocking, 5c.

With which is combined **THE MINING JOURNAL**

Eimco 102—

for medium size tunnels and construction jobs.
Equipped with a $\frac{3}{4}$ yard bucket requires only
8'6" headroom and loads at the rate of 3
yards per minute.

Write for more information.

EIMCO

THE EIMCO CORPORATION
The World's Largest Manufacturers of Underground Rock Loading Machines
EXECUTIVE OFFICES AND FACTORIES SALT LAKE CITY 8, UTAH U. S. A.

BRANCH SALES AND SERVICE OFFICES
NEW YORK 31-32 SOUTH STREET • CHICAGO 1319 SOUTH WALLACE STREET
BIRMINGHAM 41A 3140 FAYETTE AVE. • DULUTH MINN. 316 E. SUPERIOR ST.
EL PASO TEXAS MILLS BUILDING • BERKELEY CALIFORNIA P. O. BOX 740
KELLOGG IDAHO 315 MARIE STREET

AFFILIATED COMPANIES: SOCIETE EIMCO, PARIS, FRANCE
EIMCO GREAT BRITAIN LTD., LONDON, ENGLAND
AGENTS IN ALL PRINCIPAL CITIES THROUGHOUT THE WORLD

You can "EUCS" for

MORE PROFIT IN EVERY PAYLOAD!



Model FD Rear-Dump being loaded with 15 tons of bauxite in Arkansas.



Dumping 22 tons of iron ore into the crusher on the Minnesota Iron Range—Model TD Euclid.

A 6-yard shovel loading 30 tons of heavy excavation into a Model LD in a Pennsylvania anthracite pit.

- Rear-Dump Euclids are designed and built to move rock, coal, ore and overburden and other heavy excavation at the lowest cost. Easy loading ... large capacity ... speed on the haul road and dump ... long life in heavy duty service ... these are some of the Euclid features that mean more pay in every payload.

There are models for every off-the-highway hauling requirement. Some of the variations in models that are available include five or ten speed transmissions ... semi-rigid or spring mounted drive axles ... manual or hydraulic booster steering ... standard or quarry type body.

Excellent parts and service facilities of a world-wide distributor organization are quickly available ... assure prompt, efficient service when needed. For full information on the Euclid line of earth moving equipment call or write today.



The EUCLID ROAD MACHINERY Co. Cleveland 17, Ohio



EUCLIDS

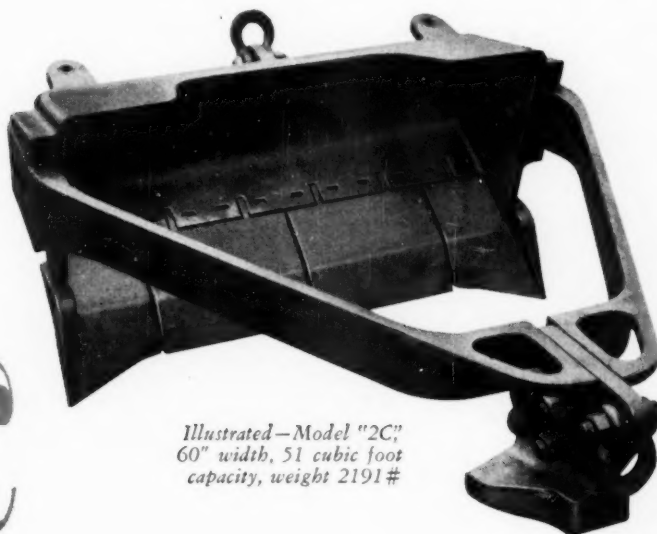


Move the Earth



Cut Your Scraping Costs with new

Pacific



*Illustrated—Model "2C"
60" width, 51 cubic foot
capacity, weight 2191 #*

"SLUSHMASTER" SCRAPERS

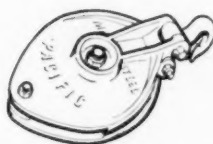
| MODEL | SIZE | WEIGHT |
|-------|------|--------|
| 2A | 26" | 398# |
| 2A | 30" | 424# |
| 2A | 34" | 452# |
| AB | 36" | 622# |
| AB | 42" | 664# |
| 2B | 36" | 1176# |
| 2B | 42" | 1314# |
| 2B | 48" | 1400# |
| 2C | 60" | 2191# |

Move *more* ore at lower cost with the *most efficient* scraper on the market. Outstanding features: New digging angle for quick loading. Digs in, gets a *full* load in a *single* pass, regardless of type or size of material or slope of muck pile. Rides on runners on back haul thus eliminating wear on cutting edges. New, simplified method of attaching blades and side cutters—change them underground in 15 minutes. New harness design. Easy disassembly. Extra heavy-duty construction throughout. Write for bulletin.

Pacific "Slushmaster" scrapers are offered in a complete line of widths and capacities to suit your hoist horsepower and operating requirements.

Alloy Steel & Metals Company

1862 EAST 55TH ST., LOS ANGELES 58, CALIF.



Use These Related Pacific Products for Best Results on All Scraper Operations: Complete line of Pacific Sheave Blocks. Full and half shroud. With hook, shackle or safety shackle. Made of quality manganese steel. • Pacific Sheave Anchors are made of tough alloy steel, properly heat treated for maximum strength. Available in 4 popular sizes.

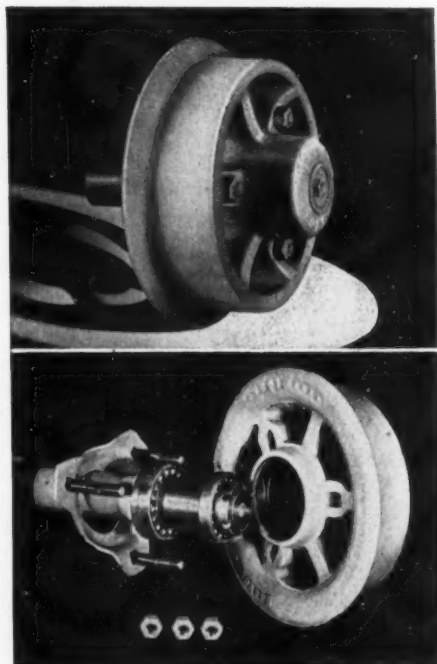
**here's why S-D "FLOATERS"
are guaranteed against
BEARING FAILURE...**



Proper bearing adjustment is automatic!

Because one of the two bearings "floats" into perfect adjustment, there are never any loose or tight bearings on S-D "Floater" Ball Bearing Wheels. That's why we can guarantee the "Floater" wheel against bearing failures for 5 years. Diagram above of a demounted "Floater" shows the heart of the wheel—that magic "floating" bearing that automatically adjusts itself when wheel is mounted and the three retaining bolts are pulled up tight. The extra large bearing absorbs all side thrusts and carries the bulk of the load. Any workman on the job can remove and replace a "Floater" Wheel because "Floater" bearings always remain in perfect adjustment on the axle whether the wheel is off or on. Remember, too, that "Floaters" have solid closed front hubs and positive back seals to keep foreign matter out and grease in! That's why so many "Floaters" often run 5 years and more on a single greasing. The S-D "Floater's" low cost of operation is certainly worth investigating. Without question, S-D "Floaters" run easier, run smoother and cost far less in maintenance than any other mine car wheel!

FOR COMPLETE INFORMATION, WRITE
SANFORD-DAY IRON WORKS, KNOXVILLE, TENN.



SANFORD - DAY IRON WORKS

MINING WORLD, published monthly except in April when publication is semi-monthly, by American Trade Journals, Inc., 121 Second Street, San Francisco 5, California. Entered as second class matter at the post office at San Francisco, California, under Act of March 3, 1879.

More and More

Cummins® Diesels

More Cummins Diesels are being delivered in new heavy-duty highway trucks using engines of 150 h.p. and over than any other make of engine—**gasoline or Diesel!**

And more 200 h.p. model NH-600 Cummins Diesels are being delivered in new heavy-duty highway trucks than any other engine—**gasoline or Diesel!**



**Diesel power by
CUMMINS**

Lightweight High-speed Diesel Engines (50-550 hp) for:
On-highway trucks • off-highway trucks • buses • tractors
earthmovers • shovels • cranes • industrial locomotives
air compressors • logging yarders and loaders • drilling
rigs • centrifugal pumps • generator sets and power units
work boats and pleasure craft.

CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA

EXPORT: CUMMINS DIESEL EXPORT CORPORATION, COLUMBUS, INDIANA, U.S.A.—CABLE: CUMDIEX

(8-21) **CUMMINS DIESEL SALES OF IDAHO, INC.**

1204 Front Street • Boise, Idaho • Tel. 3783

CUMMINS DIESEL SALES OF OREGON, INC.

1225-35 Southeast Grand Ave. • Portland 14, Ore. • Tel. East 7146

Branches: Eugene, Oregon; Medford, Oregon

Authorized Sales & Service: Coos Bay Boat Shop, Coos Bay, Oregon

CUMMINS DIESEL SALES CORPORATION OF WASHINGTON

1520 Fourth Avenue South • Seattle 4, Wash. • Tel. Main 7160

CUMMINS DIESEL SALES, INC.

South 155 Sherman St. • Spokane 5, Wash. • Tel. Madison 0101

JANUARY, 1951

WATSON & MEEHAN

1960 Folsom Street • San Francisco 3, Calif. • Tel. Market 1-8930

Branch: Fresno, California. Authorized Sales & Service: Connell Motor Truck Company, Stockton, Calif.; Frank J. Coyle, Sacramento, Calif.; Connell Motor Truck Company, Redding, Calif.; Fred E. Barnett Company, Eureka, Calif.; Nevada Transit Company, Reno, Nevada.

CUMMINS & MORAN

426 West Madison Street • Phoenix, Ariz. • Tel. 4-4040 and 4-2504

Branch: Albuquerque, New Mexico. Authorized Sales & Service: Cooper Tractor Service, Yuma, Arizona; Sterling Diesel Service, Las Vegas, Nevada; Willis Diesel Engine Service, El Paso, Texas.

CUMMINS INTERMOUNTAIN DIESEL SALES COMPANY

1030 Gale Street • Salt Lake City, Utah • Tel. 9-3768

This
Is
Really
One
For
The
Book!



FEW PEOPLE would expect a blasting cap plant to be one of the safest places to work. Yet Atlas workers, on December 6, 1950, completed five years of making Manasite blasting caps and electric blasting caps without a single lost-time injury! During this period, they produced well over 250,000,000 of these detonators.

The last injury serious enough to send an employee home from work, five years ago, was a wrenched back. The one before that, a bruised ankle. In fact, no lost-time injury has been caused by an explosion in the plant since Atlas converted to Manasite blasting caps and omitted fulminate of mercury as an ingredient in these products some twelve years ago.

Little did anyone realize, then, the new degree of safety which would be made possible in the plant, as well as in the quarries, mines and construction jobs where blasting caps are used. Thanks to pioneering by Atlas research, engineers and experienced production employees, the safety of making and using blasting caps has made a great forward stride. Manasite detonators give greater effectiveness to the safety precautions which must always be followed in handling explosives.

Manasite is typical of Atlas contributions to safer, more effective, and more economical blasting. That's why you can expect to get the *right* answers to blasting problems from Atlas—originator of Manasite detonators and the famous ROCKMASTER "16" Blasting System.

Rockmaster and Manasite: Reg. U. S. Pat. Off.

Offices in Principal Cities

ATLAS EXPLOSIVES
"Everything for Blasting"



SAN FRANCISCO 4, CAL.

ATLAS POWDER COMPANY

SEATTLE 1, WASH.

MINING WORLD

with which is combined
THE MINING JOURNAL

A Miller Freeman Publication

Published monthly except in April when publication is semi-monthly

JANUARY, 1951

VOL. 13 No. 1

SAMPLE LOCATIONS

| | |
|--|----|
| Capitol Concentrates | 7 |
| Small Mines' Importance Emphasized | 10 |
| Northwest Mines Meet | 15 |
| Platoro on the Conejos—by Muriel Sibell Wolle | 19 |
| Mining Men and Their Activities | 20 |
| INTERNATIONAL SECTION | |
| International Panorama | 27 |
| Uranium Mining is Primarily a Field for Small Operators—by William E. Haldane | 28 |
| Trout Rebuilds Manganese Mill | 33 |
| American Developers & Prospectors Plan Meeting | 37 |
| Flying Impressions of Africa —by Harlow Harding | 38 |
| Prominent Men in International Mining | 39 |

PUBLISHING OFFICE

San Francisco 5, Calif. 121 Second Street
GARfield 1-5887

BRANCH OFFICES

Seattle 4, Wash. 71 Columbia St., MAin 1625
Los Angeles 13, Calif. 124 W. Fourth St., MUtual 8196
Vancouver, B. C. Royal Bank Bldg., MArine 1520
New York 17, 370 Lexington Ave., MUrray-Hill 3-9295
Chicago 4556 N. Paulina, LOngbeach 1-2796

GENERAL MANAGER, San Francisco M.F. HOLSINGER
EDITOR GEORGE O. ARGALL, JR.
PRODUCTION MANAGER J. M. STALUN
EASTERN MANAGER, Chicago KAREL WEGKAMP
FIELD EDITOR HOWARD WALDRON
NEWS BUREAU V. P. COLLINS
ASSOCIATE EDITOR, Vancouver CHARLES L. SHAW
NORTHWEST MANAGER MILLER FREEMAN, JR.

Published by

AMERICAN TRADE JOURNALS, INC.
MILLER FREEMAN, President
L. K. SMITH, Vice-President
W. B. FREEMAN, Publisher



Copyright 1950 by American Trade Journals, Inc.

Contents may not be reproduced without permission.

SUBSCRIPTION RATES

| | |
|--------------------------------|--------|
| U.S., North, South and Central | |
| American Countries | \$3.00 |
| Other Countries | \$4.00 |
| Single Copies | \$0.35 |
| Directory Number | \$2.00 |

DRIFTS AND CROSSCUTS

U.S.G.S. Program Must Not Be Curtailed

The fact that United States Geological Survey personnel is to be used in furthering the provisions of the Defense Production Act of 1950 is good news for the public in general and the mining industry in particular.

The Survey, unlike others, did not seek the job. There was a "job to be done and the Survey was called on." Needless to say, it "will do the job to the best of its ability," which is the best in the country.

Of greatest importance, however, is the long term, long range, carefully planned Survey program. Work under this program started before and during World War II and is now showing important results at a time when minerals have again gone to war.

Despite the urgency of the new assignment the Survey's long range program must not be curtailed. It is paying off when needed most.

Aggressive Aid Versus Bureaucratic Buck-Passing

The mining industry of British Columbia is presently experiencing a boom which has been described as the greatest base metal boom of the century in that Canadian Province.

One of the contributing factors to this boom has been the cooperative and aggressive policy of the Provincial government in assisting the mining industry. Mining and prospecting are encouraged and assisted in many ways, one of which is the building and maintaining of mine roads. In fact, the Provincial government is only too glad to help a private operator in building a road to a newly located and promising prospect if the road will aid worthwhile exploration and development of the prospect.

The present mine road situation in the state of Idaho is one of direct contrast. The mining industry in Idaho is also expanding and new mines are being developed in remote areas of the state.

Those mines which are surrounded by federally owned or controlled lands can be reached only by roads which cross these lands. For many years the state of Idaho has assisted mine owners in building and maintaining these roads. But the last Idaho legislature determined that roads on federal land are not to be built and maintained by the state.

Once again the miner is put behind the eight ball.

Recent requests to government officials for federal aid for mine access roads drew the replies that another department had the money, or that no money was available or that Washington would do something.

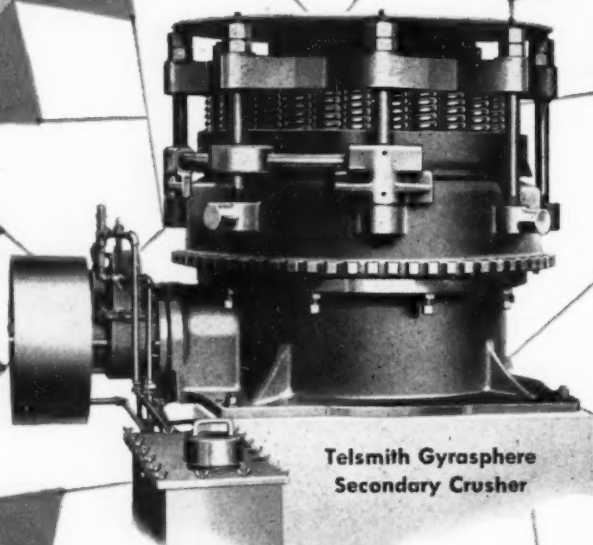
Wake up, Washington! Profit from the experience in British Columbia.

G. O. A., JR.

COMING CONVENTIONS

January 15, 16 and 17, 1951. Annual Meeting MINNESOTA SECTION, AIME, Duluth, and the two-day UNIVERSITY OF MINNESOTA MINING SYMPOSIUM.
February 1, 2 and 3, 1951. COLORADO MINING ASSOCIATION, Shirley Savoy Hotel, Denver, Colorado.
February 15, 16 and 17, 1951. NEW MEXICO MINERS AND PROSPECTORS ASSOCIATION, Hilton Hotel, Albuquerque, New Mexico.
February 18 to 22, 1951. Annual Meeting AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Jefferson Hotel, St. Louis, Missouri.

WHEREVER YOU GO...IT'S TELSMITH



Telsmith Gyrasphere
Secondary Crusher

SEND FOR CATALOG 274

SMITH ENGINEERING WORKS, 4034 N. HOLTON ST., MILWAUKEE 12, WISCONSIN

Mine & Smelter Supply Co.
Denver 17, Colo.

Mines Eng. & Equip. Co.
San Francisco 4, Calif.

Lee Redman Equip. Co.
Phoenix, Arizona

Garlinghouse Bros.
Los Angeles 21, Calif.

General Machinery Co.
Spokane 1, Wash.

Clyde Equipment Co.
Portland 9, Ore. Seattle 4, Wash.

The Sawtooth Company
Boise, Idaho

Montana Powder & Equip. Co.
Helena and Billings, Mont.

Gordon Russell, Ltd.
Vancouver, B. C.



CAPITOL CONCENTRATES

NEW 12-PAGE MINE LOAN FORM IS EXCELLENT FOR MANUFACTURERS

If anyone has the courage to wrestle with the new 12-page Government loan form, he may obtain it by writing to the Defense Minerals Administration, Bureau of Mines, Washington 25, D. C. Ask for NSRB Title 32A, Part 601—which is the sheet of rules—and for five copies of form NSRB-146.

After the shock of looking over the form and realizing it has to be filled out and filed in quadruplicate, the first discovery will be that the form bears no special relationship to the mining business but is a catch-all for the manufacturing industry. If one survives the first reading of the first 11 pages and has not gone entirely mad by the time he reads the twelfth, he will note this "little stinker": "The applicant agrees to reimburse any agency of the United States Government upon demand for any expenses incurred in connection with or arising out of this application or any loan made pursuant thereto."

The possible implications of this agreement are obvious: If some poor fellow files an application for a large loan which requires a great deal of processing, engineering and examination, and the application is turned down, he may find he has contracted ahead of time a debt of several thousand dollars.

This is known in Washington as encouraging the mining industry.

● Millikin Amendment Need Now Apparent

That a serious mistake was made in the joint House-Senate conference on the Defense Production Act of 1950 is daily becoming more evident to the nation's miners. The conferees eliminated the Millikin Amendment which called for automatic provisions to make exploration and development funds available without bureaucratic red tape. Reports indicate that there is strong feeling among certain Senators and Congressmen that a speed up in the administration of the Act in regard to increasing mineral production is needed.

● Special Exemption May Be Granted

There appears to be some hope that the producers of certain strategic minerals may be exempted from the proposed new excess profits tax. To be eligible the certification of the National Security Resources Board will be required, according to present thinking.

● Gray Market in Copper

Gray market copper is selling for as high a price as 40 cents a pound and still the Government is doing little or nothing to encourage small producers.

● A Preview of Events to Come

A series of orders issued by the National Production Authority gives an indication of what is in store for the country's civilian economy. Briefly stated, these orders will cut the use of copper for non-defense consumption during the first three months of 1951 by 15 to 20 percent; will slash non-military consumption of zinc by 20 percent starting January 1, 1951; will cut civilian consumption of nickel 35 percent, beginning January 1; and will reduce the non-military use of aluminum by 20 percent in January, 25 percent in February, and 35 percent in later months. Cobalt consumption for December was reduced by 50 percent from the average monthly use in the first half of 1950.

In announcing the consumption cut-back for copper,

William H. Harrison, chief of the National Production Authority, indicated that the flow of the red metal to some users may have to be cut off completely in the near future. Said Harrison: "As the defense program expands and more copper is required for military uses where substitutes cannot be employed, a variety of users may have to be limited. Studies looking to an order to achieve this necessary conservation are under way. Increasing amounts of copper are required for defense needs. Despite everything which can be done, there is little likelihood that the supply can be increased appreciably in the immediate months ahead."

● DMA Establishes Field Headquarters

Another step in the long-drawn-out process of getting increased mineral supplies rolling under the provisions of the Defense Production Act has been the establishment of nine field headquarters, each with a field team complete with an executive officer. The teams are headquartered at the cities indicated and with the personnel as follows: Juneau, Alaska, S. H. Lorain and W. H. Twenhofel; Spokane, Washington, A. E. Weissenborn and M. H. Volin; San Francisco, California, H. C. Miller and Ward Smith; Denver, Colorado, John H. East, Jr. and A. H. Koschman; Minneapolis, Minnesota, A. B. Needham and C. E. Dutton; Joplin, Missouri, L. T. McElvenny and D. Gallagher; Knoxville, Tennessee, Robert Laurence and J. R. Thoenen; College Park, Maryland, W. G. Agnew and Walter White; and Washington, D. C. (foreign minerals), E. W. Pehrson and W. D. Johnston.

The teams have been picked, the executive officers selected, the rules set, and all that the nation's miners have been waiting for for four months has been the opening kick-off.

● Mine Aid Still in the Future

Further cut-backs in civilian consumption of minerals may be expected next year. The tungsten, cobalt and other situations are bad, aside from the well-known shortages in zinc and copper. But the Government—that is the National Security Resources Board and other bureaus—does not seem to be too concerned and real stimulation of mining by means of loans or production contracts is actually in the future. Before long the Government agencies and the industry alike will be sorry that real support was not given to the Murray-Engle bill (S. 240—H. R. 976). The application under that legislation could have been made on half a sheet of note paper, and we would have had two years' start on the expansion program with small and large mines alike participating.

● Mine Money Should Be Earmarked

Where will the money come from for a liberal mine loan program if Chairman Symington of NSRB can be persuaded that such a program is essential to the war effort? By "Liberal" is meant one which will bring in, through exploration, development and new plants, small and marginal mines, the production from which is sorely needed and probably will be needed for years to come.

Congress appropriated \$600,000,000 for the Defense Production Act, which NSRB and the Budget Bureau are lading out. Only a part of this can be used for mining. There are, or shortly will be, before the Defense Minerals Administration enough large projects from \$50,000,000 on down to absorb around \$100,000,000. It looks as though the pickings for the smaller fellows would be pretty slim!

Congress may have to supplement the appropriation and should specifically earmark money for exploration, development, and plant expansion for mining when it does.

AMERICAN SMELTING AND REFINING COMPANY

Has Always Offered an Unfailing Market for

GOLD . . . SILVER . . . COPPER . . . LEAD . . . ZINC

Ores . . . Concentrates . . . Bullion . . . Precipitates . . . Furnace Products

For Schedules, Freight Rates, etc.

Write to Your Nearest Office

405 Montgomery Street
San Francisco 4, Calif.

P. O. Box 1111
El Paso, Texas

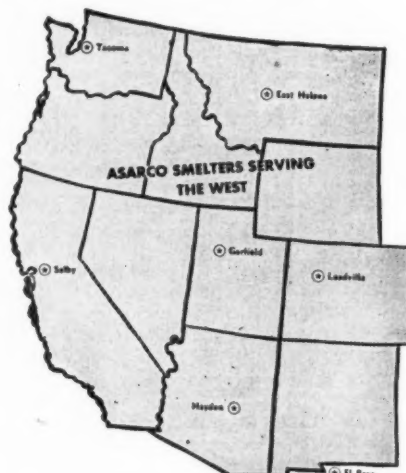
700 Pacific Nat'l Life Bldg.
Salt Lake City 1, Utah

810 Valley Bank Building
Tucson, Arizona

Tacoma 1, Washington

East Helena, Montana

607 First National Bank Building, Denver 2, Colorado



AMERICAN SMELTING AND REFINING COMPANY

DETACHABLE BITS HOT MILLING

- We will hot mill, re-temper and harden the popular types and sizes of rock bits.
- We re-shank, re-thread, and re-condition any type, size, or length of Drill Steel.
- We manufacture and maintain a complete stock of new drill rods, gads, chisels, spades, and all other tools used in Pneumatic Paving Breakers or Jack Hammers.

EMSCO CONCRETE CUTTING COMPANY

2751 East Eleventh Street

Los Angeles 23, California

AN 3-4151

For Rent

Large and small portable air compressors, paving breakers, jack hammers, chipping hammers, pneumatic tools, and air hose.

We specialize in concrete cutting and demolition work.

**EMSCO
AIR HOSE COUPLINGS**

Dependable, Prompt Service

Phone or write
FOR PRICE SCHEDULES

● Treasury Wants Its Percentage

The latest wrinkle of the Treasury Department, it is now rumored, will be to tax currently, as received, any exploration money which may be granted to a mine under the defense program. Thus, one agency would give the money and another take part of it back. How one could retain enough to complete a program is a mystery only known to the wonderful wizards of the Treasury. However, as there appears to be no present intention to make exploration grants, the Treasury notion need not bother the miner at the moment.

● Most-Needed Minerals Listed

The metals and minerals to which the Defense Minerals Administration will give primary consideration were listed recently by James Boyd, head of the new agency. These are: antimony, asbestos, beryllium, chromite, cobalt, columbium-tantalum, copper, corundum, fluor-spar, graphite, manganese, mica, molybdenum, nickel, platinum group metals, sulphur, talc, tungsten, and zinc.

Boyd offered the services of DMA to help mine operators secure Government guarantee of a private loan for mining work; to secure a Government loan; or to obtain contracts for disposing of mine output at satisfactory prices.

● Freight Car Shortage Develops

While the National Production Authority is clamping controls on the civilian consumption of copper, large quantities of the red metal are piling up at the western smelters for lack of freight cars in which to transport it. This backlog may result in actual curtailment of production, thus making a tight supply still tighter.

According to the Defense Transportation Administration, all available freight cars have to be used to move the Middle West's immense grain crop which is perishable and the shortage will not be relieved until these shipments are taken care of. It also reports that as yet no power has been delegated to any agency to direct the allocation of cars.

● Let's Tell Symington Some Facts

W. Stuart Symington, chairman of the National Securities Resources Board, holds a very responsible and vitally important position and should know what he is talking about when he speaks. That he is not informed—or has accepted misinformation—is indicated by a public statement in which he charged that the fight against suspending the copper excise tax was "led by a copper executive who believes production should be held down, but not his opportunity for profits; because his own company's earnings in the second quarter alone of 1950 were far in excess of his profits for the entire year 1945."

No "copper executive" has even been in the picture. The fight has been led by the Arizona Copper Tariff Board, an agency created by law and its membership appointed by the Arizona governor precisely for that purpose. Symington's statement is ridiculously inaccurate. Most "copper executives" are on the other side of the fence, as their companies own foreign mines.

Symington might well have said, however, that the "great crusader" for continued suspension of the excise tax on foreign copper is a well-known executive who wants to have available a plentiful supply of low-cost foreign metal produced by cheap labor. He could have pointed out that the copper fabricating company represented by this "crusader" earned \$3.58 per share for the first half of 1950 and in 1945 earned only 33 cents per share for the whole year.

● Little Encouragement Given Manganese

With all the talk about the manganese shortage—a sure bottleneck for the steel industry—the Bureau of Federal Supply seems to be doing little to encourage the production of domestic manganese which may need over-market prices, but prices well within the Buy-American sphere. In fact, the Buy-American Act seems to be about as dead as ever.

PROMPT DELIVERY

Low Reagent Inventory
at your mill



Western mills benefit doubly by Cyanamid's Complete Metallurgical Chemical Service on metallic and non-metallic minerals.

We offer a wide choice of reagents for many beneficiation needs with savings on inventory carrying-charges through combination shipments from nearby warehouse stocks. We offer also the practical help of Cyanamid Field Engineers and the Cyanamid Mineral Dressing Laboratory in the selection and application of the most efficient reagent combination for your ore under your mill conditions.



Orders for Cyanide, Flotation Reagents and other Metallurgical Chemicals may be placed with American Cyanamid Company, Azusa, California; El Paso, Texas; or c/o Weicker Transfer & Storage Co., Denver, Colorado.

AMERICAN

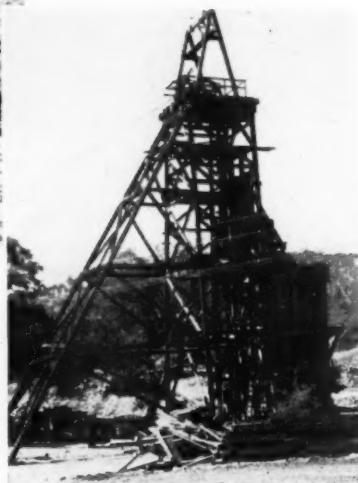
Cyanamid
COMPANY

MINERAL DRESSING DIVISION
30 ROCKEFELLER PLAZA, NEW YORK 20, NEW YORK



The Colorado uranium miner who operates the small mine pictured at LEFT has an entirely different type of operation from . . .

... the California copper producer operating the small mine shown in the photograph below.



SMALL MINES' IMPORTANCE EMPHASIZED BY METALS DEMAND

Can and will the small mine survive and return in increasing number to the American scene?

"Certainly," says a typical small mine operator who has spent his life mining and has been a successful strategic mineral producer during two World Wars. "The small miner has existed through depressions, low metal prices, and times of material scarcities—he has had to be tough to

live." "Just give him an incentive and he will produce the ore," replies another. A third, when questioned by MINING WORLD, said, "All I want is equal treatment from Washington to that given by my own government to the foreign miners."

In view of these statements, and of the wars in Asia and defense demands for metal, MINING WORLD presents a staff report on some of the United States' small mines—what they did during World War II, what they are doing now and why they always will be needed.

WHAT IS A SMALL MINE?

A small mine, of course, will mean an entirely different thing to a Colorado uranium miner and a California copper producer. Four of the bases for considering the size of a mine are:

1. Daily tonnage mined.
2. Metal tonnage recovered.
3. Dollar value of output.
4. Number of men employed.

Under the first factor a would-be expert recently considered small mines as those producing less than 1,000 tons of ore per day.

Under the second factor the Committee on Interior and Insular Affairs, Eighty-First Congress, First Session, made what may be a more accurate and reasonable definition of a small base metal mine. The Committee

wrote into one bill a "small mining enterprise" section and set certain standards for aid to such mines. A small base metal mine is defined in the bill as "a mine with an average monthly production of less than 100 tons in the aggregate of copper, lead, and zinc. . . ."

Table I shows the number of small base metal lode mines in the United States in 1948 based on the above definition. During the latter part of the Premium Price Plan, small mines, i.e., those producing less than 50 tons of Rule 13 metal per month, were considered as "small" for Limited Exploration Premiums.

The gross or net dollar value of all minerals and metals produced by a mine is another measure of the size of a mine. The sum of \$100,000.00 per year has been said by some as the measure for a small mine.

In considering the size of a mine in terms of the number of men employed, the statement by W. Stuart Symington, chairman, National Security Resources Board, that a small business was considered as one that employed less than 500 people might be considered a guide because mining is most certainly a business.

The term "small mine" to many will invariably convey the impression of a "marginal mine." This term, of course, is erroneous, and although

Table I
NUMBER OF COPPER, LEAD AND ZINC LODE MINES IN THE UNITED STATES IN 1948 AND THE NUMBER OF MINES PRODUCING LESS THAN 100 TONS OF METAL PER MONTH

| Location | Number of Mines | Number of "Small Mines" |
|--|-----------------|-------------------------|
| States west of the Mississippi River: | | |
| Arizona | 360 | 344 |
| California | 241 | 240 |
| Colorado | 271 | 261 |
| Idaho | 194 | 158 |
| Ark., Kan., Mo. and Oklahoma | 294 | 262 |
| Montana | 250 | 242 |
| Nevada | 350 | 347 |
| New Mexico | 91 | 81 |
| Utah | 118 | 106 |
| Washington | 30 | 25 |
| Other States | 35 | 0 |
| States east of the Mississippi River | 110 | 90 |
| Total | 2,344 | 2,193 |

some small mines are marginal, many small mines have been and are exceedingly profitable to operate.

After carefully considering the mine-size criteria given above, *MINING WORLD*, for the purposes of this report, considers as simple, understandable and logical that a small mine is any mine producing less than 100 tons of ore per average working day.

TYPES OF SMALL MINES

For many minerals, nature has been the determining and limiting factor in regard to the size of mine that can be developed. There are many minerals so occurring that they can best be recovered by small, careful, slow, mining methods. Examples of these minerals are beryl, mica (sheet), columbite and tantalite which are found in pegmatites or residual deposits derived from pegmatites. These minerals are all recovered most efficiently by small mines.

There are certain metals which can be mined and processed into a final product by simple, inexpensive and small scale operations. Placer gold and mercury are examples. One small organization, and for that matter one man, can perform successfully all the operations necessary to produce a high unit-value product which has a ready market without intermediary costs, charges, deductions, services, and freight.

The many small deposits of a wide variety of minerals in varied combinations also necessitates small mining of small deposits. Fundamental, of course, is the fact that a single veinlet of high-grade gold ore can only be mined successfully on a small scale.

Another type of small mine is that which is developed from deposits limited in size and marginal in grade and which can be exploited only by small scale methods during extremely favorable economic periods.

WHAT HAS BEEN SAID ABOUT SMALL MINES

Small mines and their struggle for survival have been and will continue to be the subject of much discussion in the technical press, at mining conventions and in the halls of government.

Herbert Hoover in the September issue of *Mining and Contracting Review* reported that "The number of nonferrous metal mines in the Mountain and Pacific States has decreased from about 11,000 in 1935 to 2,300 in 1949. This is an appalling degeneration in a vital part of the whole national economy."

Robert S. Palmer, executive director of the Colorado Mining Association, in July 1949 said, "Our small metal mines, like the Indians and buffalo, are gradually passing from the scene of activity."

Senator George Malone of Nevada recently emphasized the importance of small mines when he said, "In order to have big mines you first must have small mines. In order to have small mines you first must have prospecting and exploration."

F. W. Libbey, director of the State of Oregon Department of Geology and Mineral Industries reported, "A healthy mining industry is es-



Copper in Arizona . . .



Tungsten in California . . .

Lead-zinc in Colorado . . .



JANUARY, 1951

Mica in South Dakota.



Table II

BERYL, MICA AND TANTALITE PRODUCTION IN POUNDS FROM SMALL DOMESTIC MINES FOR YEARS 1942 TO 1946

| Mineral | 1942 | 1943 | 1944 | 1945 | 1946 |
|-----------------|-----------|-----------|-----------|-----------|-----------|
| Beryl | 538,000 | 712,000 | 776,000 | 78,000 | 200,000 |
| Mica* | 2,762,000 | 3,448,000 | 1,523,000 | 1,299,000 | 1,079,000 |
| Tantalite | | 9,000 | 700 | 6,000 | 3,000 |

* Uncut sheet and punch.

essential to the security of this country. The western mining industry is far from healthy. Witness the large decrease in number of shipping mines over the past five years, the absence of prospecting, and the scarcity of exploration projects except by a few large mining companies."

The Committee on Interior and Insular Affairs, Eighty-First Congress, mentioned above, also stated at the First Session that "History shows that most of the principal mines now producing were developed from small mines. In fact, small mines are often producers of big mines. Evidence presented to the committee shows that current economic trends have driven many small mines out of existence and are threatening to drive out many more, with the consequent dangers of monopoly control to our historic concepts of competition and free enterprise."

ACCOMPLISHMENTS OF SMALL MINES DURING WORLD WAR II

A review of World War II shows the wide variety and important production contribution small mines made to the war effort.

Pegmatite Minerals

Under the pegmatite minerals described above, the domestic production of beryl, columbite, mica and tantalite, all came from small mines. A summary of production is shown in Table No. II.

The increase in mica output resulted from an increase in the number of producing mines from 80 in April 1942 to 1,056 in August 1943 through Federal Government support.

Mercury

The increase in output of mercury from 1938 to 1943 was due largely to the output of small mines which increased in number from 91 to 197 with a production increase from 17,991 to 51,529 flasks. As the mercury price was \$191.00 per flask, two- or three-man operations could produce a flask or two per day, or as little as two flasks per week, profitably.

Copper, Lead and Zinc

The importance of keeping the small copper, lead and zinc mines in operation has been reported by the subcommittee on Mines and Mining of the Committee on Public Lands, House of Representatives, Eighty-First Congress, as follows:

"Conclusion—Premium price plan

for copper, lead and zinc was most effective in keeping in business small and marginal producers and was perhaps the best antimonopoly device in this field which has ever been developed. It provided a stable income and encouraged exploration and development of ore bodies. It insured the mining of marginal ores from already-developed opened properties . . . and during the time it was in effect, more small mines were working than probably at any period in the country's mining history."

Under this plan, 4,174 mines in 30 states and Alaska received initial quotas and 3,591 made shipments of either copper, lead or zinc. A total of 381 small mines in 18 states also received "limited" exploration premiums. Table No. III gives a geographic breakdown of these mines.

Tungsten

The production of tungsten was increased from 6,567 short ton units of

Table III

LOCATION BY STATES OF COPPER, LEAD AND ZINC MINES RECEIVING "INITIAL" QUOTAS BETWEEN FEBRUARY 1, 1942, AND JUNE 30, 1947, AND "LIMITED" EXPLORATION PREMIUMS BETWEEN SEPTEMBER 1, 1946, AND DECEMBER 31, 1947

| State | No. of Mines Receiving "Initial Quotas" | No. of Mines Receiving "Limited" Exploration Premiums |
|----------------------|---|---|
| Arizona | 769 | 91 |
| Alaska | 6 | — |
| Arkansas | 25 | — |
| California | 194 | 13 |
| Colorado | 503 | 74 |
| Idaho | 302 | 26 |
| Illinois | 33 | 7 |
| Kansas | 157 | 5 |
| Kentucky | 20 | 4 |
| Massachusetts | 1 | — |
| Michigan | 16 | 4 |
| Missouri | 250 | 40 |
| Montana | 404 | 26 |
| Nevada | 403 | 9 |
| New Mexico | 158 | — |
| New York | 5 | — |
| New Jersey | 2 | — |
| North Carolina | 9 | — |
| Oklahoma | 270 | 3 |
| Ohio | 1 | — |
| Oregon | 13 | — |
| Pennsylvania | 1 | — |
| South Dakota | 2 | — |
| Tennessee | 20 | 3 |
| Texas | 24 | 2 |
| Utah | 342 | 41 |
| Vermont | 2 | — |
| Virginia | 6 | — |
| Washington | 48 | 4 |
| Wisconsin | 184 | 28 |
| Wyoming | 4 | — |

60 percent WO_3 in 1941 to a wartime peak of 11,368 in 1943. The increase was due to greater production from several large mines, but the greater number of small mines, 112 in 1943 compared with 68 in 1941, was an important factor.

Chromite

Production of chromite during 1943, the peak year, was 160,120 short tons from 175 producers (148 in California), a record number. Of these 169 were small mines, as each produced less than 10,000 tons.

Vanadium

The year 1943 when 9,975,878 pounds of V_2O_5 was produced was the record-breaking war year. Of significance is that 212 small mines produced 63.4 percent of the total production.

RECONSTRUCTION FINANCE CORPORATION PROGRAM DURING WORLD WAR II

During the war the Reconstruction Finance Corporation made both Preliminary Development and Development Mining Loans (sometimes called "B" and "C" loans) under Section 5d and Section 14 of the RFC Act, as amended. The loans were limited to a maximum of \$40,000.00 to one borrower and were made to 340 small mines in 25 states and Alaska. The loans resulted in the production of 20 strategic and critical minerals from January 1, 1942, through March 31, 1949.

Table No. IV shows the number, location by state, and production of the 20 metals and minerals resulting from these loans.

METALS RESERVE COMPANY

This company was created on June 28, 1940, by the Reconstruction Finance Corporation to purchase, stockpile and sell metals and minerals. The establishment of small lot purchase depots by the Company in March 1942 was of great help to the small miner because the depots afforded a regular local market, at known and fixed prices for his ores. The program proved so beneficial to small producers and resulted in such an increase in mineral production that by July 1943 some 30 small lot purchase depots were operating in Arizona, Arkansas, California, Colorado, Montana, Nevada, New Hampshire, New Mexico, New York, North Carolina, Oregon, Idaho, Utah, and South Dakota. These depots purchased chrome, manganese, tungsten, antimony, tin, columbium, tantalum, vanadium and oxidized lead-zinc ores; beryl, mica, and mercury; and molybdenite concentrates.

EMERGENCIES REOPEN SMALL MINES

History proves that as emergencies have developed, making increased production vital and every pound of metal important, the small miner is the one whose output has been sought. He could reopen his mine more quickly, he could recruit a labor force of older men and of those who could not or would not work in the larger mines. He made older equipment and machinery do the job, repaired and improvised. True, the efficiency of his operation was low in terms of tons per man shift, but he produced while the big mine was awaiting delivery of the electric shovel.

Another important fact is that the small miner and particularly the "leaser" can and does produce minerals which might otherwise never be mined and used by mankind.

SMALL MINES IMPORTANT

No better measure of the importance of the small mines can be given than what E. H. Snyder, president and general manager of the Combined Metals Reduction Company, Salt Lake City, Utah, said. "The underground mines furnishing most of our domestic production of lead and zinc today were developed by prospectors and small operators prior to 1920. I firmly believe that the cheapest and best way to develop the new mines that we shall need for the future is to make it possible for the small operator to continue again the business of making prospects into mines."

THERE WILL ALWAYS BE A SMALL MINER

The small miner takes pride in his work and accomplishments. He works with a small crew, the men working together as a team to do whatever job is necessary. Union rules and regulations do not dictate what man must perform what operation.

The small miner will live in isolated mining camps, endure the hardships, take the gamble to make a "stake" while he makes a bare living and drives that drift which the geologist did not recommend.

The faith, determination, and hard work of the small miners resulted in the discovery, exploration, and development of most of the large mines of today.

The philosophy of the small miner is typified by his reaction to one of the nation's largest, most mechanized and efficient underground mines when he said, "This was once a small mine, it had to be found by a prospector. Just give me another 60 days and two cents more a pound for lead and you can have your big mines."

Freedom and civilization are based on the opportunity the small miner has. It must be preserved.

JANUARY, 1951

Table IV
PRODUCTION OF CRITICAL AND STRATEGIC MINERALS BY RECONSTRUCTION FINANCE CORPORATION'S
DEVELOPMENT MINING LOAN BORROWERS FROM JANUARY 1, 1942, TO MARCH 31, 1949

| State | Number of Properties | Gold, Ounces ¹ | Silver, Ounces ¹ | Copper, Pounds | Lead, Pounds | Zinc, Pounds | Mercury, Pounds | Manganese, Long Ton Units Mn | Chromium, Long Ton Units Cr ₂ O ₃ | Tungsten, Short Ton Units WO ₃ | Vanadium, Pounds V ₂ O ₅ | Antimony, Pounds | Fluorite, Pounds | Short Ton Units CaF ₂ | Iron, Long Tons |
|---------------------------|-------------------------|------------------------------|--------------------------------|-------------------|-----------------|-----------------|--------------------|------------------------------------|---|---|--|---------------------|---------------------|-------------------------------------|-----------------------|
| Alabama | 1 | | | | | | | | | | | | | | |
| Alaska | 2 | 5,153.01 | 299,730.9 | 6,125,060 | 5,236,546 | 9,950,805 | 75,112 | 77,430 | 205,000 | 2,042 | | | | | |
| Arizona ² | 82 | | | | | 161,383 | 33,987 | | | 7,714 | | | | 25,590 | |
| Arkansas | 3 | 1,073.61 | 1,635.1 | 140,285 | 9,139 | 3,109,919 | 19,227 | 210,911 | 39,769 | 7,611 | | | | | |
| California ³ | 44 | 1,073.61 | 74,279.2 | 959,366 | 738,095 | 20,474,259 | | | 22,893,374 | 15,732 | 46,073 | | | 82 | |
| Colorado ⁴ | 69 | 18,960.74 | 977,021.2 | 3,409,906 | 20,474,259 | 4,092,085 | | | 4,225,412 | | | 85,458 | | | |
| Idaho | 14 | 1,820.31 | 226,623.08 | 963,457 | 39,124 | 2,123,894 | | | 5,469,478 | | | | | | |
| Illinois | 1 | | | | | 1,024,964 | | | | | | | | | |
| Kansas | 4 | | | | 250,515 | | | | | | | | | | |
| Kentucky | 2 | | | | | | | | | | | | | | |
| Michigan | 1 | | | 46,239 | | | | | | | | | | | |
| Missouri | 14 | | | | 250,029 | 5,063,374 | | | | | | | | | |
| Montana ⁵ | 27 | 2,079.28 | 196,616.21 | 795,545 | 3,485,457 | 3,957,429 | 108,086 | 65,438 | | | | 24,926 | | | |
| Nevada | 12 | 888.56 | 141,679.8 | 1,111,986 | 1,554,681 | 5,397,778 | | 1,857 | | | | | | 1,051,124 | 452 ⁶ |
| New Mexico | 13 | 224.56 | 27,597.6 | 205,039 | 833,641 | 2,276,377 | | | | | | | | | |
| North Carolina | 1 | 1.57 | 2,124.7 | 409,261 | 1,388,754 | 11,933,941 | 18,460 | 3,986 | 16,693 | | | | | | |
| Oklahoma | 5 | | 1,394.9 | 2,836 | 1,621 | | | | | | | | | | |
| Pennsylvania | 1 | | | | | | | | | | | | | | |
| South Dakota ⁷ | 1 | | | | | | | | | | | | | | |
| Texas | 1 | | | | | | | | | | | | | | |
| Utah | 25 | 907.74 | 1,770.1 | 344,950 | 5,816,462 | 6,579,636 | | 6,606 | | 3,196 | | | | 21,925 | |
| Virginia | 1 | | | | | | | | | | | | | | |
| Washington | 3 | 34.94 | 96,480.5 | 453,599 | 10,892,867 | 30,774,839 | | | | | | 199,198 | | | |
| Wisconsin | 3 | | | 5,243 | 351,651 | 13,295,052 | | | | | | | | | |
| Wyoming | 5 | | | | | | | | | | | | | | |
| TOTALS | 340 | 31,084.32 | 2,301,787.82 | 15,320,125 | 56,169,473 | 129,301,853 | 146,786 | 408,896 | 326,900 | 40,738 | 47,721 | 314,611 | 3,854,590 | 1,105,592 | 18,383 |

¹ By-product of copper-lead-zinc production. ² Includes production from DPC-financed plant. ³ Pyrite concentrate. ⁴ Iron ore, 56% natural. ⁵ Includes 7,583 pounds of BeO. ⁶ Includes 458.2 pounds of quartz crystals. ⁷ Includes 5,516 pounds of MoS₃. ⁸ Includes 2,433 short ton units of Li₂O. ⁹ Includes 1,751.85 tons of steatite tail.

AMERICAN ZINC, LEAD AND SMELTING COMPANY

Buyers of Zinc Concentrates
Suitable for Smelting in Retort
and Electrolytic Smelting
Plants, also Buyers of High
Grade Lead Concentrates.

*Address Communications to Ore Buying
Department*

Paul Brown Building
ST. LOUIS, MISSOURI

927 Old National
Bank Building
DUMAS, TEXAS SPOKANE, WASHINGTON

International Smelting and Refining Co.



Buyers of

**Gold, Silver, Copper, Lead,
Zinc Ores and Concentrates**

•
ORE PURCHASING DEPARTMENTS

MIAMI, ARIZONA

818 Kearns Bldg.
SALT LAKE CITY, UTAH

•
Copper Smelter—MIAMI, ARIZONA

Lead and Lead-Zinc Smelter } **TOOELE, UTAH**
Lead-Zinc Concentrator }

MAGMA COPPER COMPANY

Buyers of

COPPER, GOLD

AND SILVER ORES



**MINES AND SMELTER AT
SUPERIOR, ARIZONA**

Bunker Hill Smelter

Owned and Operated by

**Bunker Hill & Sullivan
Mining & Concentrating
Company**

Location: KELLOGG, IDAHO
(R. R. Station: Bradley, Idaho)

Purchasers of GOLD, SILVER and LEAD Ores.
Producers of "Bunker Hill" Brand of Refined Pig Lead,
Refined Gold, Refined Silver, Antimony Metal, Anti-
monial Lead, and Cadmium Metal.

For information regarding Ore Rates, Address

BUNKER HILL SMELTER

KELLOGG, IDAHO

CONSIGN ALL SHIPMENTS to BRADLEY, IDAHO

NORTHWEST MINERS MEET

The 56th Convention of the Northwest Mining Association Featured Technical Sessions on Drilling, Geology and Modern Mill Planning

Mine operators and their technical staffs from Washington, Idaho, Oregon, Alaska, British Columbia, Montana, and Yukon gathered at the 56th Annual Convention of the Northwest Mining Association at Spokane, Washington, on December 1 and 2, 1950.

Meeting at a time when "world peace hangs on a thread," the more than 400 delegates heard some encouraging words from the Federal Government when A. E. Weissenborn, of Spokane, regional geologist of the U. S. Geological Survey report that "loans are now being processed in Washington for increasing the production of minerals under the provisions of the Defense Production Act of 1950." However, he would not make any predictions as to when and what amount of loan funds would be available to mine operators and developers in the Northwest. Many of those at the meeting who heard the report about loans were definitely of the opinion that it would be some time before any metals would actually be produced aided by the terms of the Act despite the fact that it became law on September 8, 1950.

Outstanding Technical Sessions

The Columbia Section of the AIME cooperated with the Northwest Mining Association and the mining bureau of the Spokane Chamber of Commerce in arranging an outstanding program. Of particular interest to the large crowd were the technical sessions organized by the following chairmen: Geology, A. E. Weissenborn, Spokane, regional geologist, U. S. Geological Survey; Mining, C. A. R. Lambly, Metaline Falls, Washington, superintendent, Pend Oreille Mines & Metals Company; and Milling, Frank McKinley, Kellogg, Idaho, assistant mill superintendent, Bunker Hill & Sullivan Mining & Concentrating Company.

Mine and mill operators, university, State and Federal officials, all co-operated with E. C. Stephens of Spokane, geologist for the Anaconda Copper Mining Company and program chairman, in giving their time and services in preparation and presentation of the program.

How to Build a 200-Ton Mill

Under the chairmanship of C. Y. Garber, mill superintendent, Bunker Hill & Sullivan Mining & Concentrating Company, the Saturday morning session on *Design and Operation of Small Concentrating Plants* pre-

sented seven outstanding metallurgists to solve the problem of "How to Build a 200-Ton Flotation Mill." The mill would treat four percent lead and four percent zinc sulphide ore in a quartzitic gangue. A 65-mesh grind of the medium hard ore was required, conventional flotation reagents could be used, there was no slime interference, and to clean the lead once and the zinc twice would be necessary.

After an outline of bin design by Dr. W. W. Staley, professor of mining at the University of Idaho, the consensus of opinion called for a 200-ton crushed ore storage bin. Chairman Garber reported how the increased use of slushers underground resulted in a wetter ore for mills to treat. Wet and sloppy ore created a problem in the mill because it was difficult to convey by belts, but the use of a corrugated, gold dredge, tailing staker belt had overcome the problem at one mill.

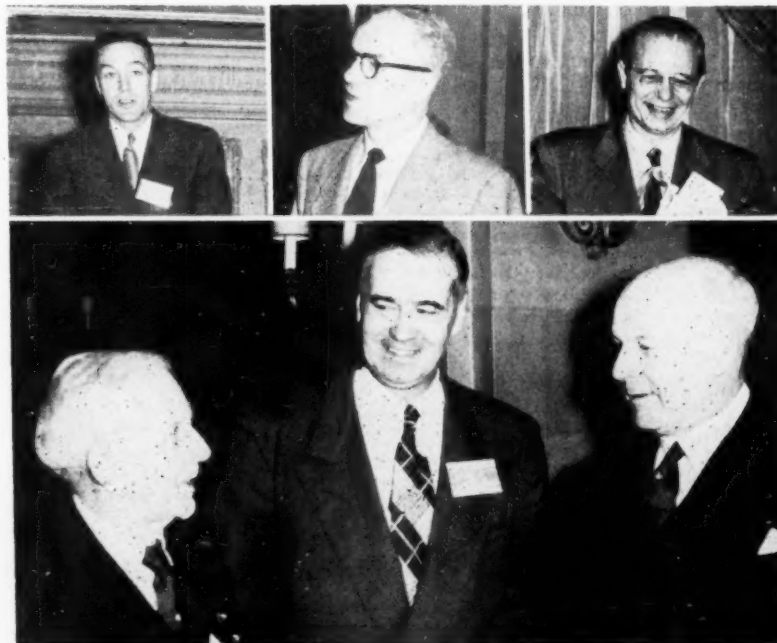


E. C. Stephens, Spokane, geologist for the Anaconda Copper Mining Company, is the newly elected president of the Northwest Mining Association.

The discussion on filtering brought out the desirability of placing the filter over the concentrate bins. Several mill operators reported difficulties in making filter cloths last over 40 days. Possible causes of cloth deterioration were considered to be damage by mold action and the oxidation of the products being filtered.

In summary, the ideal mill build-

TOP (left to right): Frank McKinley, assistant mill superintendent, Bunker Hill & Sullivan Mining & Concentrating Company, brought a new idea of group participation to convention programs in the milling session and it was the hit of the convention. R. R. McNaughton, manager, Metallurgical Division of The Consolidated Mining & Smelting Company of Canada, Ltd., Trail, B. C., represented his company during the meeting. Elmer Johnson, president of the Silver Dollar Mining Company, reports new developments in Idaho's Coeur d'Alenes. BOTTOM (left to right): Walter Hovey Hill, consulting engineer of Grangeville, Idaho, has attended the meeting for 50 years. Roger O. Oscarson, mining engineer, who was re-elected as secretary of the Northwest Mining Association. Hon. R. C. MacDonald, Minister of Mines, Province of British Columbia, came from Victoria to tell how the Canadians encourage mining.





Left to right: James L. Leonard, president and general manager of the Metaline Mining & Leasing Company, makes the announcement that uranium mineralization has been discovered in the company's zinc orebodies at Metaline Falls. A. E. Weissenborn, regional geologist, U. S. Geological Survey, was chairman of the session on *Application of Geology to Mining* and acted as spokesman for the federal government on the Defense Production Act of 1950. W. S. Phillips, chief engineer, Chelan Division, Howe Sound Company, reported how to drive raises, crosscuts and drifts by "Long Hole Drilling at the Holden Mine." A report on drilling at the Pend Oreille Mines & Metals Company's mine at Metaline Falls was given by L. M. Kinney, mine superintendent. "Drilling Methods in Stopes of the Bunker Hill Mine" was discussed by Edward B. Olds, assistant mine foreman.

ing should be large enough to afford plenty of room around all equipment, the grinding and classification sections should be on one floor and all of the rest of the equipment on a single lower floor. Feed to flotation would be by gravity flow and the circuit would be as flexible as possible.

Rock Drilling Methods

The first technical session was held Friday afternoon, December 1st, with John J. Curzon, manager, Chelan Division of the Howe Sound Company, presiding. Four papers were presented to show what the latest drilling practice was in stopes, drifts and raises, long holes, and drilling with the new Jackleg.

"Drilling Methods in Stopes of the Bunker Hill Mine" was outlined by Edward B. Olds, assistant mine foreman, who reported that stope rounds were drilled for "breasting down" the ore and that drifter drills mounted on three-inch pneumatic columns were used. Single-use bits were used in the abrasive medium-hard quartzitic ore. The company is making tests using an experimental-model Jackhammer mounted on an aluminum alloy shell equipped with a tilting device which permits rolling the machine over for

easy steel removal from the hole without changing the alignment of the machine.

In conclusion, Olds reported that "the apparent success of the new drilling equipment points toward the use of lighter drilling equipment with smaller drill holes which will maintain or even increase rock penetration rates."

L. M. Kinney, mine superintendent of Pend Oreille Mines & Metals Company, outlined raising and drifting practices at Pend Oreille. The 5 by 6 foot raises are driven in the hard, fractured, cherty ore and a 17-hole, "burn" round can pull up to 10 feet. Use of carbide bits for raise drilling so speeded up the rate of drilling that one machine shift can now drill a round which previously took two shifts.

Drifts 7½ by 8 feet in size are driven in the soft dolomitic footwall. Jumbos, automatic drifters and mucking machines are used and an average round of nine feet is broken. In many instances the six-hole, "tapered-burn-cut" round has broken 14 feet, but the tramming capacity was the limiting factor in rate of heading advance.

"The Use of Percussion Drills and

Tungsten Carbide Bits for Drilling Blast Holes at the Holden Mine" was described by W. S. Phillips, chief engineer of the Chelan Division of the Howe Sound Company. He reported that "output per man shift and machine shift for percussion blast-hole drilling is approximately twice that of diamond drilling," that the costs were 40 percent less, and that labor costs were reduced about 50 percent. Experimental work using long-hole rounds for drifting, raising and crosscutting was progressing, and the system was being used extensively. In raise work only the lower five or six feet of holes up to 35 feet long were loaded and blasted at one time. Succeeding rounds would then be loaded and blasted. The same system was used in connecting crosscuts to the top of inaccessible raises with the bottom of the holes blasted first and succeeding rounds broken toward the point of drilling and loading.

J. C. Heaslip, manager, detachable bit division of Canadian Ingersoll-Rand Co., Ltd., outlined some of the advantages of the use of the new Jackleg as follows: set-up time is less, less powder is used, faster drilling speeds are attained, increased

A complete panel of experts was on hand to present their views on "How to Build a 200-Ton Flotation Mill." Among these men were (left to right) Louis Prater, metallurgist, Idaho Bureau of Mines and Geology, who discussed crushing; C. Y. Garber, mill superintendent, Bunker Hill & Sullivan Mining & Concentrating Company, who was chairman of the session and whose discussion drew many worth-while questions from the audience; Norman Sather, mill superintendent, Hecla Mining Company, who started the session by describing the mill site; Homer March, mill superintendent, American Zinc, Lead & Smelting Company, who covered grinding and classification; J. C. Crampton, mill superintendent, Pend Oreille Mines & Metals Company, who outlined the flotation section of the proposed mill; Archie McKinley, mill superintendent, Sidney Mining Company, who spoke on general arrangements; and L. A. Grant, mill superintendent, Day Mines, Inc., who concluded the session by outlining filtering at the mill.



drilling time is available per shift, use of longer steel is possible, increased output per man shift was evident, and less capital investment in equipment and less air was required.

Welcoming Luncheon

Friday noon, December 1st, was the time of the welcoming luncheon and joint meeting of the Columbia Section of the AIME and the Northwest Mining Association at the Davenport Hotel. Dr. Donald H. McLaughlin, president of the AIME, was the luncheon speaker. He was introduced by Stanly A. Easton, president of the Bunker Hill & Sullivan Mining & Concentrating Company.

Dr. McLaughlin reported the problems faced by the minerals industry in maintaining a supply of metals for our industrial civilization. He said that the mining industry was going ahead meeting the challenge and getting increased production from old districts, but that greater skills were required to find new deposits and new districts. He added that "true conservation was the recovery of all minerals" and that was being done by many companies. However, "metals are underpriced in terms of other things and the industry is furnishing unfairly cheap metals for the world," he added. Speaking about gold, he said "future security can be based on a gold standard only, but we can't go back on the old gold standard because the value of the paper dollar has changed," and, "the value of paper in relation to gold must be determined and then must go back to gold."

Geologic Session

The geologic session was based on the *Application of Geology to Mining* and, in a series of four papers, the role of geology from fundamental research down to direct application for findings ore was outlined. The first paper prepared by S. W. Hobbs of the U. S. Geological Survey dealt with the "Basic Data and Research" and was read by Allen Griggs of the Survey. Emphasis was placed on the fact "that all geologic work was research" and that a "good map was the first step in any geologic study." The application of geology in a specific mine in a definite mining district, the Coeur d'Alenes, was outlined by Thomas Gillingham, geologist for the Bunker Hill & Sullivan Mining & Concentrating Company. After a brief outline of the development of mining geology and the working methods of the mine geologists, he outlined the functions of the mine geological department as: the supervision of diamond drilling and logging of cores; the direction of sampling and preparation of assay maps; the laying out of development headings; the planning of stopes and raises in relation to ore and delimiting of

ore for mining; the maintenance of ore grade and elimination of wasteful mining; and the maintenance of ore reserve maps.

Report on Recent Developments

Harry W. Marsh, secretary of the Idaho Mining Association, reported on mining development in Idaho to the convention. He said that Idaho mine operators must have Government help in building and maintaining adequate roads through federally controlled areas of Idaho and that if the Government wants metal it must help the miner with roads. Speaking about lead-zinc production in Idaho, he prophesied "that if called upon the Coeur d'Alenes could exceed the greatest year of World War II in the production of both lead and zinc, if men were available."

Robert H. Stebbins, geologist for the Washington State Division of Mines and Geology, reported that Stevens County had eight producing mines, and that 28 additional mines were being developed. At present there are 15 more mines under de-

velopment and five more producers than one year ago.

Association Officers

The trustees of the Association met before the convention and elected E. C. Stephens, Spokane, president for the coming year. He is a geologist for the Anaconda Copper Mining Company. Wallace G. Woolf, manager of the Sullivan Mining Company's zinc plant at Kellogg, Idaho, was elected second vice president. Re-elected were: first vice president, David E. Watson, secretary for Thomas Consolidated Mines; treasurer, E. K. Barnes, Spokane; and secretary, Roger O. Oscarson, consulting mining engineer of Spokane.

Elected to three-year terms as trustees were: J. C. Kieffer, Kellogg, Idaho, manager, Spokane-Idaho Mining Company; E. R. Marble, Tacoma, Washington, manager of the American Smelting & Refining Company's Tacoma smelter; J. W. Melrose, Spokane, consulting geologist; and R. J. Towne, Spokane, manager of the Towne Equipment Company.

NORTHWEST MINING ASSOCIATION'S DECLARATION OF POLICY

We pledge to our government full and complete cooperation, directly and in carrying out the obligations we have assumed under the United Nations Charter. This means that we will use all our resources to produce the metals and minerals needed in the present emergency.

To do this we ask our government for the following:

1. A deferment of men employed in the production of metals and minerals. We must not repeat the mistakes of World War II with relation to manpower for mining.
2. Allocation of steel and other materials as well as power for mine and smelter operation and for the manufacturer of mine machinery and appliances and for necessary repairs and replacements.

3. A tax policy which will assist and not retard a full out policy of production. Our national tax policy must encourage the mining of minerals far in advance of normal production. We oppose the application of so-called excess profits taxes to a wasting-assets industry.

4. Financial policies which will make possible the discovery and development of low grade and marginal ores.

AMENDMENT OF MINING LAWS: This is no time to attempt to change mining laws. Men engaged in this enterprise must give full time and effort to production. We recognize the rights of other interests and will cooperate at the proper time to adjust our laws to protect them from abuses. In the meantime we ask to be unhampered as we try to perform our duty in furnishing materials necessary to our common defense.

MINE FINANCING: The development of our mineral resources by private capital is the American way in a free society and in view of the world crisis now confronting our nation every effort should be made to remove all handicaps and restrictions to the flow of venture capital essential to the search for and development of mineral deposits.

GOLD AND SILVER: We believe in a currency with the traditional base of gold and silver.

We believe in the free circulation of gold and silver, and that the right to own and trade in these metals in any market be restored to all citizens.

We believe that Government seignorage on silver should be eliminated.

VALLEY AUTHORITIES: We oppose the creation of valley authorities as inimical to our system of individual and State rights.

TARIFFS: The American standard of living requires that adequate tariffs be provided as protection against foreign competition. Richer deposits, lower labor rates, manipulation of foreign currency, dumping, and the operation of foreign cartels are all a constant menace to the mining industry. We must encourage, not destroy, our nation's ability to produce metals.

RECIPROCAL TRADE AGREEMENTS: The Administration of Reciprocal Trade Agreements should provide against the further weakening of competitive position of the domestic mining industry under normal market conditions.

ROADS: We urge the construction and maintenance of mine to market and access roads for both old and new mining districts for the purpose of making available a supply of strategic minerals and metals and forest products.

GOVERNMENT LANDS: We favor reopening of lands now withheld from mineral location under reservation by the Federal Government.

Why Junk Your Old Crusher Plates?

MANGATONE N. M.
Will Rebuild Them
Better Than New

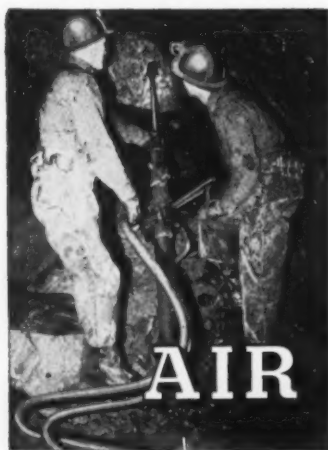


It's nothing short of a crime to go on year after year throwing away valuable and expensive manganese castings just because the **USABLE SURFACES** become worn beyond efficiency. Crusher plates are a case in point. Generally the corrugations average only 10% of the weight of the plate but 90% of the plate ends up in the scrap pile.

Look closely at the actual photograph above and see how we can correct this condition and save you plenty of money by rebuilding your used plates with **MANGATONE N.M.** Notice the partially completed plate with the perfect corrugations back in place. To top it off, you will find that the corrugations we rebuild on your old plate will crush about 40% more material than the original corrugations.

Call in our field man. Why waste any more good money and castings!

RESISTO-LOY COMPANY • • Grand Rapids 7, Michigan

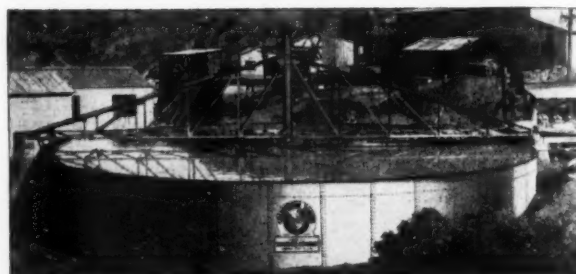


**GOODALL
"MINE-
KING"
AIR HOSE**

Kee pneumatic equipment working at full capacity with **MINE-KING** Air Hose. Extra thick pliant rubber cover resists severest abrasive action. A brown oil-proof tube, encased in high quality braided framework, gives **MINE-KING** the fortitude to withstand gouging, and prevent hose wall separation due to oil and moisture. Assure a steady flow of air with extra durable **MINE-KING** Hose.

Other Goodall Products: Conveyor belts, Rubber footwear, Waterproof clothing, all types of hose.

GOODALL RUBBER CO.
LOS ANGELES - SAN FRANCISCO
SEATTLE - DENVER - SALT LAKE CITY



**QUICK
SHIPMENT**

**COLUMBIAN
BOLTED STEEL
MINING EQUIPMENT**

AGITATORS • THICKENERS • SOLUTION TANKS • ORE BINS, ETC.

No costly delays. Your order is handled in record time by an expert staff of engineers and designers. Then it is fabricated in one of the best equipped manufacturing plants in the Mid West, with modern presses especially designed for the purpose.

Lower your costs with **Columbian Mining Equipment** for permanent installation, yet portable if change in location is necessary. Standard construction for domestic use or for export by ocean freight. Special if for export via mule-back or airplane to final destination. Order from distributors listed below—or write direct for complete facts.

COLUMBIAN STEEL TANK CO. • Kansas City, Mo.

Distributors in the United States

Denver Equipment Company
1400 Seventeenth Street, Denver, Colorado

Emco Corporation
34 South 4th West Street, Salt Lake City, Utah
Western Machinery Company
760 Folsom Street, San Francisco, California

Distributors—Foreign

Western Machinery Co., S. A.
Apartado Postal 215

Avenida Ejercito Nacional 458-D
Colonia Chapultepec Morales
Mexico, D. F.

Muriel Sibell Wolle Describes

PLATORO ON THE CONEJOS

Tucked away on the floor of a mountain valley, 9,500 feet above sea level and surrounded by high peaks of the Rockies, is Platoro, known to old-timers as a mining camp, to sportsmen as fishing country, and to the U. S. Bureau of Reclamation as the site of a new dam. The Spaniards were the first white men to climb into the protected valley and to find in it enough traces of silver and gold ore to christen the area Platoro, but not until the middle eighties did prospectors begin to struggle over the steep mountains that lay between them and the district, working their way up the Conejos River from Antonito.

Summitville, another mining camp high on a nearby mountain, was already booming and was reached by a rugged road from Del Norte, but not until 1888 was a survey made to extend the road from Summitville to Platoro. With its completion, supplies for the new camp went in by this road, freighting outfits climbing to the top of South Mountain and then plunging down the tortuous trail to the Alamosa River, only to climb a 600-foot divide, beyond which lay Platoro in the valley of the Conejos River.

The principal ore, which was gold, lay in strong fissured veins, some measuring up to 50 feet, and rich at the surface. As prospects were developed, pockets of gold and silver tellurium were uncovered and these proved profitable to the lessees who continued to work the mines after the initial boom was over. According to one old-timer, the first ore shipped from the camp was three tons which came from the Merrimac mine and was dug from a depth only 16 feet below the surface. This ore netted the owners \$355. Besides the Merrimac there were many other lodes discovered between 1889 and 1896, and before long more than a hundred properties had been patented.

As early as 1889, the Mammoth, which turned out to be one of the best mines of the camp, was being worked and before it closed down it had produced more than \$300,000 in gold. The Parole (No. 1 and No. 2) was also a good producer and it, the Mammoth and the Revenue together produced millions. Other prominent properties included the Valley King, Valley Queen, Illinois, Pavonia, Forest King, Forest Queen, British Queen, Ninety-Six, the Glacier group, Queen Bess group, the Ore-kiss, Silver King, and Congress group.

Below the many mine properties, on the flat meadow, was the town—

its streets laid out like a gridiron and cut by the meandering loops of the Conejos River.

Back in 1889 there was plenty of excitement in camp when O. E. LeDuc disappeared. He left Platoro on foot for La Jara, carrying with him a sizable nugget of gold, and when he did not return his partners became concerned and started hunting for him. They found out that on his way to the San Luis valley he had stopped at the house of a Mexican who lived between Capulin and Cat Creek. A search of the property revealed his body buried in a shallow grave with bullet holes in his back. A posse started out after the Mexican, who had disappeared. He was caught, tried, sentenced and hanged.

Platoro had three booms in all, the last two being in 1912 and in 1916-1917. A great deal of low and medium grade gold and silver ore was opened up, assaying 40 percent gold and 60 percent silver. The booms were short-lived, not because the ore was exhausted, but because lack of capital for development of properties curtailed production.

As late as the 1930's the Mammoth lode was being worked through a tunnel which had been driven into the mountainside; its mill stood down by the river. (The Parole shaft, which was on the Mammoth Mining Company's property, had not been worked for over forty years.) According to a mine report in 1939, the Valley Queen had been inactive since 1914, but the Forest King, which had lain idle for nearly as long, was being worked. Deep snows closed all roads to the camp during the winters and caused

the suspension of operations until spring.

During the middle thirties, the U. S. Forest Service was busy improving the highway into the camp by way of Monte Vista and Jasper. The road from Antonito to Platoro was passable, but was said to be a "terror."

In June, 1941, I visited Platoro for the first time. I saw the big dump of the Mammoth mine and the derrick over the shaft of the Parole, but Platoro was a ghost town with its cabins empty or boarded up and with cattle roaming its streets. Last summer I visited Platoro again and got talking to an old-timer to whom the camp is "home." He described its appearance during boom days when its population reached 8,000. He dug up a picture, taken forty years ago on the Fourth of July, which showed a parade stepping smartly down the main street. He assured me that the last burial in the cemetery was made in 1912 and that the body was that of the postmistress who shot herself.

One story led to another. He spoke of the log saloon down at the forks of the road—the saloon where Poker Alice, Calamity Jane, and Killarney Kate, the three women gamblers from Creede, used to come to gamble with the boys, and how all three smoked big cigars while they played. He described the young Englishman who blew into camp wearing a derby, spats and patent leather shoes. He, too, went to the saloon and when the miners saw him they decided to have some fun. One of them told him to dance and he refused. "We'll make you, shouted the men as one shot a

Continued on Page 76

Platoro as it looked in 1941, before the building of the Platoro Dam turned the town into a construction camp.



ACTIVITIES OF U. S. MINING MEN

FRANK J. SMITH has been elected vice president in charge of iron ore operations of Oglebay, Norton & Company and will be located at the company's northern office in Montreal, Wisconsin, for the time being. He will continue with the same responsibilities he had in his former position of range manager. Smith joined Oglebay, Norton in 1908 after graduation from Michigan College of Mining and Technology. He has worked on the company's properties on the Menominee, Gogebic and Cuyuna ranges and also has been responsible for taconite development on Reserve Mining Company's property at the eastern end of the Mesabi Range.



H. E. Bush, mining engineer of Angels Camp, California, is doing consulting work for Stewart and Nuss, Inc., Fresno, who have mining interests in the Mt. King and Royal gold mines near Copperopolis. He says they are working toward an eventual large-scale gold operation, using power shovels.

F. A. Bachich, formerly at Bonanza Mines, Inc., Yellow Pine, Idaho, is now superintendent for the Sierra Talc & Clay Company Big Pine, California.

Duane Franklin, operator of the Cheechako Mining Company has moved from Chatanika to Ferry, Alaska. Main offices for the company are at Fairbanks.

Charles Will Wright, who recently spent a week at Rifle, Colorado, with his son, Fred, was much impressed with the importance of the U. S. Bureau of Mines' investigations, particularly in drilling and blasting the oil shales. The investigations include the use of various diameters and lengths of holes, grades of explosives and amounts of burden, and various types of tungsten carbide bits in both percussion drills and hydraulic rotary drills mounted on Jumbo machines. The importance of extending these investigations to metal mining operations is evident, as such precision studies will indicate how economies in man-hours, explosives and power may be made.

John Knapp, former mill superintendent of the Pride of West mine at Silverton, Colorado, has returned to Canada, where he has a job with a Canadian mining company.

Chris Poulsen, president and general manager of the Snowbird Mining Company, Inc., at Anchorage, Alaska, has returned there after sev-

eral months spent in Seattle, Washington, on business.

Robert L. Kidd has returned from three years with the Army of Occupation in Japan as process metallurgist for the Natural Resources Section, GHQ, SCAP. He also was consultant for Japanese non-ferrous metallurgical operations. At present he is vacationing at home, 7007-C Mountain View Avenue, Huntington Park, California, until he locates further work along metallurgical-efficiency lines.

J. F. Wolff, Sr., has retired as general mining engineer of Oliver Iron Mining Company, Duluth, Minnesota, after over 43 years with the company, although he will remain available in a consulting capacity. He is recognized by the mining profession not only for his outstanding work in determining from mine workings and drill samples the detailed structure of the Cuyuna, Mesabi and Gogebic iron ranges, but also for numerous technical articles and active civic work. Succeeding Mr. Wolff is **Lloyd J. Severson**, who started his mining career with Patino Mines & Enterprises Consolidated in Bolivia, joined Oliver in 1941, then left to serve the U. S. Foreign Economic Administration in both Bolivia and Spain as mining engineer from 1942 to 1944, returned to Oliver as geologist in 1947, and was made assistant general mining engineer in 1949.

Kenelm Winslow, mining engineer, formerly with the Hanna Coal & Ore Company's Clifton iron mine in New York, now is working for the Mount Hope iron mine engineering department, Dover, New Jersey. The Mount Hope is owned by the Warren Foundry & Pipe Company.

Neil Whiting, mining engineer, has been made mine superintendent for the Idaho-Maryland Mines Corporation, Grass Valley, California. He will handle the Maryland and Brunswick properties and succeeds **J. C. O'Donnell**, who resigned.

Lewis D. Clark has been made assistant professor of mining at Lafayette College, Easton, Pennsylvania. His past experience includes being field engineer for the Rhokana Corporation in Northern Rhodesia, efficiency engineer for the International Nickel Company at Sudbury, Ontario, Canada, and last year he led a prospecting party through British Columbia under the auspices of Kenneco Explorations Ltd. Another mining engineer to accept a position

at Lafayette College recently is **Henry J. Petrie**, who will teach mining. He had been estimating and applications engineer for the Worthington Pump and Machinery Corporation, Harrison, New Jersey.

Albert Randall is in charge of the Construction Aggregates Corporation's stripping contract at Steep Rock Iron Mines, Steep Rock Lake, Ontario, where his company is hydraulic dredging the overburden at the Hogarth mine. Headquarters of Construction Aggregates is Chicago, Illinois.

Lyle Myers, consulting geologist of Iron River, Michigan, is in Ontario, Canada, on an exploration assignment for the W. S. Moore Company of Duluth, Minnesota.

James R. Willett, **William A. Bauman**, **Clarence F. Rippl**, **Richard Mann**, **George Lerick**, **John M. Hedin** and **John Christianson** are new Pickands Mather and Company employees at the company's Michigan and Minnesota mines. Willett, a graduate of the University of Illinois, is at the Embarrass iron mine, Buhl, Minnesota. Bauman, a graduate of the University of Wisconsin, is with the engineering department at Ironwood, Michigan, where Hedin also is working. Rippl, a graduate of Missouri School of Mines, is with the engineering department at Hibbing, Minnesota, where Mann, Lerick and Christianson, a graduate of Michigan Tech, also are employed.

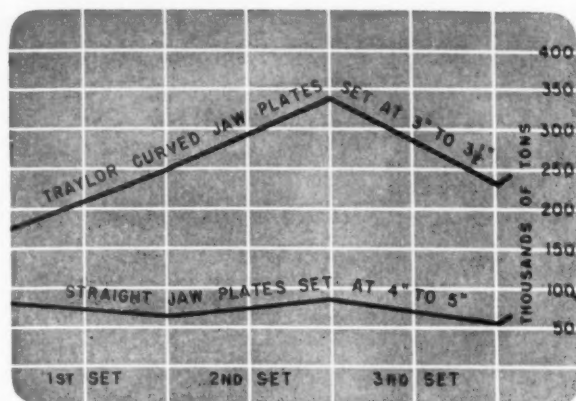
HARRISON COBB, prominent mine operator, has been appointed to a three-year term as a member of the Colorado State Mineral Resources Board by Governor Walter Johnson. Cobb has had wide experience in mining gold and tungsten ores in Colorado and Wyoming and is now operating mines in Boulder County, Colorado. He is vice president of the Colorado Mining Association.



William Ewing has retired as superintendent of the Mud Creek operation of the Havenstrite Mining Company, Candle, Alaska, and has returned to Seattle, Washington, to live. His place has been taken by **Larry Doheny**.

E. R. Tyler, formerly engineer at Pickands Mather & Company's Embarrass mine, has been transferred to the Wade mine at Buhl, Minnesota.

Traylor Curved Jaw Crusher Plates outlast ordinary plates almost 3 to 1



This chart is based on actual records kept on a 36" x 48" jaw crusher. Operating at a setting of 4" to 5", the average life of straight jaw plates was 96,500 tons. When fitted with Traylor smooth-faced, curved jaw plates, this same crusher averaged 276,724 tons per set . . . at a setting of 3" to 3½". Plate life was increased almost 3 to 1!

No choking . . . no packing . . . stops power waste. Crushing force is used with greater efficiency to produce a more uniform product with fewer waste fines.



Traylor Curved Jaw Crusher Plates . . . standard equipment on all Traylor Jaw Crushers . . . can be installed in many other crushers to transform them into modern, up-to-date primary breakers. Traylor's Curved Crushing Surfaces cut costs of primary stone reduction in many ways . . . outlast ordinary plates as much as 3 to 1. If you want to increase the efficiency of your plant, investigate Traylor Curved Jaw Plates today.

Traylor

Rotary Kilns, Coolers and Dryers • Grinding Mills
Jaw, Reduction and Gyratory Crushers • Crushing Rolls

MAIL COUPON
to get full details.

TRAYLOR ENGINEERING & MANUFACTURING CO.
306 MILL ST., ALLENTOWN, PA.

I want to see how easily Traylor Curved Jaw Plates can be installed in my present crusher.

Name _____

Company _____

Address _____

SALES OFFICES: New York, N.Y.; Chicago, Ill.; Los Angeles, Calif.
Canadian Mfrs: Canadian Vickers, Ltd, Montreal, P.Q.

A "TRAYLOR" LEADS TO GREATER PROFITS

JOY MACHINES

Field-Proved in Service

**Made by the world's largest
manufacturer of
Underground Mining Equipment,
and the pioneer in
mechanized mining,**

**JOY Equipment can give you
the great advantage of**

**MORE PRODUCTION
AT LESS COST**

The JOY Line is COMPLETE

Note, in the comparison below, how JOY EQUIPMENT stands out in its ability to take care of Metal Mine Requirements

| JOY | Company B | Company C | Company D | Company E | Company F | Company G | Company H |
|-----------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| ROCK DRILLS | | | | | | | |
| Spaders | YES | YES | YES | YES | YES | NO | YES |
| Busters | YES | YES | YES | YES | YES | NO | YES |
| Jack Hammers | YES | YES | YES | YES | YES | NO | YES |
| Stoppers | YES | YES | YES | YES | YES | NO | YES |
| Drifters | YES | YES | YES | YES | YES | NO | YES |
| Drill Jibs | YES | YES | YES | YES | YES | NO | YES |
| Drill Jumbo (Track) | YES | YES | NO | NO | NO | NO | YES |
| Drill Jumbo (Trackless) | YES | NO | NO | NO | NO | NO | NO |
| DRILL BITS | | | | | | | |
| Carbide Bits | YES | YES | NO | NO | NO | NO | NO |
| Detachable Bits | NO | YES | NO | NO | NO | NO | NO |
| Thro-Way Bits | YES | NO | NO | NO | NO | NO | NO |
| HOISTS | | | | | | | |
| Single Drum Utility | YES | YES | YES | YES | NO | NO | NO |
| Single and Two Drum Shaft | YES | NO | NO | NO | NO | NO | NO |
| Two Drum to 15 HP | YES | YES | YES | NO | NO | NO | NO |
| Two Drum to 125 HP | YES | YES | NO | NO | NO | NO | NO |
| Three Drum to 15 HP | YES | YES | YES | NO | NO | NO | NO |
| Three Drum to 125 HP | YES | YES | NO | NO | NO | NO | NO |
| Sheaves | YES | NO | NO | NO | NO | NO | NO |
| CORE DRILLS | | | | | | | |
| Blast Hole | YES | YES | NO | YES | NO | NO | NO |
| Exploratory | YES | YES | NO | YES | NO | NO | NO |
| COMPRESSORS | | | | | | | |
| Portable | YES | YES | YES | YES | YES | NO | YES |
| Vertical—Air Cooled | YES | YES | YES | YES | YES | NO | YES |
| Vertical—Water Cooled | YES | YES | YES | YES | YES | NO | NO |
| Large Heavy Duty | YES | YES | YES | YES | YES | NO | NO |
| LOADERS | | | | | | | |
| Scraper Slides | YES | YES | NO | NO | NO | NO | NO |
| Mine Car Type | YES | NO | YES | NO | NO | YES | NO |
| Trackless Loaders (Medium) | YES | NO | NO | NO | NO | YES | NO |
| Trackless Loaders (Heavy) | YES | NO | NO | NO | NO | NO | NO |
| MATERIAL HANDLING | | | | | | | |
| Shuttle Cars | YES | NO | NO | NO | NO | NO | NO |
| Chain Conveyors | YES | NO | NO | NO | NO | NO | NO |
| Shaker Conveyors | YES | NO | NO | NO | NO | NO | NO |
| Belt Conveyors | YES | NO | NO | NO | NO | NO | NO |
| MINE VENTILATION | | | | | | | |
| *Portable Blowers, Electric | YES | NO | NO | NO | NO | NO | NO |
| Portable Blowers, Air | YES | NO | NO | NO | NO | NO | NO |
| Large Mine Fans | YES | NO | NO | NO | NO | NO | NO |

WRITE FOR BULLETINS, OR

Consult a Joy Engineer

W&D M2572

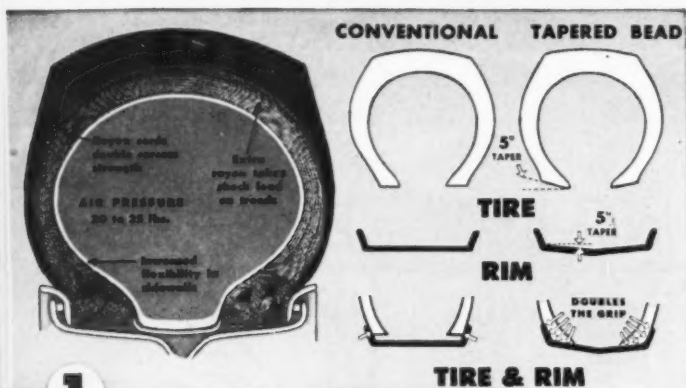
JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO



HERE'S WHY **19** m.p.h.



BIG TIRES INCREASE TRACTION—Tournadozer's 21.00 x 25 low-pressure tires give you greater ground-gripping traction and increased flotation in sand, mud, snow or ice. Tapered bead doubles tire-to-rim grip, prevents tire slipping. Rayon cords add strength and flexibility . . . increase tire life.



INSTANT GEAR SELECTION—Change gear ratios instantly, automatically, with finger-tip air-valve lever. Constant power retains vital momentum . . . keeps dirt rolling . . . gets more work done. Tournadozer travels 100' in 3rd gear while ordinary crawler tractor stops to shift gears.

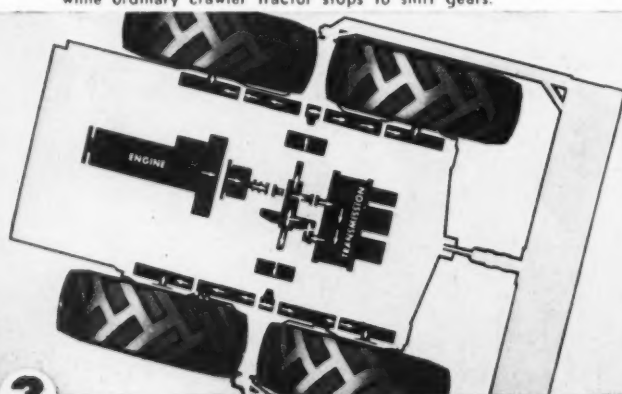


FIRST this job-proved dozer on rubber "runs" at 19 m.p.h., instead of crawling at 5 to 8 m.p.h. It maneuvers twice as fast—and dozes twice as fast as the average crawler. It gives you reverse speeds to 8 m.p.h. . . . cuts deadhead cycle time by 2.5 to 1. And, you get far more use from its greater speeds, because you have instantaneous speed selection and can change into higher gears without shifting or losing momentum.

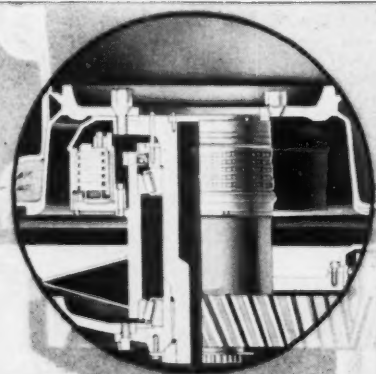
SECOND Tournadozer has the high-speed mobility to put normal waiting periods to work. When needed on scattered odd jobs, operator just hops on this big dozer . . . and drives 19 m.p.h. cross-country or over highways. No blocking, no waiting for trailer, no loading or unloading delays. Giant 21.00 x 25 low-pressure tires prevent damage to pavement and other surfaces . . . and, in poor footing, give you plenty of traction to pull through mud, sand, or snow which would stall ordinary crawler dozers.

THIRD you can keep Tournadozer working and earning during the off-season by equipping it for sub-contracts or rentals with any of 10 auxiliary tools — including Scraper, Angledozer, Logging Winch, Side Crane, or Snow Plow. With each unit, Tournadozer's 180 h.p. engine, 4-wheel drive, and rubber-tired mobility will pay off in more work done.

Let your LeTourneau distributor give you all the facts. Call him . . . or write for new Tournadozer Bulletin TD-117 TODAY!



180 H.P. PUSH OR PULL—Hangs on and moves heavy loads even in toughest going. Low compression ratio diesel engine gives more power with less fuel. 4-wheel drive provides quick pickup on level or up steep grades. Rig rolls on rubber . . . has no tracks to grind in abrasive materials.



INSTANT BRAKING POWER—Short-coupled 6' wheelbase and instantaneous shift give you a compact, fast-stepping unit. Heavy-duty 4-wheel air brakes, with 1305 sq. in. of braking surface on each wheel — 5220 sq. in. on all four — give you safe, sure, complete control at all times.

Send now to: **R. G. LeTOURNEAU, Inc., Peoria, Illinois**

We may be in market for one or more Tournadozers. Please send information on ☐ 180 h.p. C Tournadozer or ☐ 122 h.p. D Tournadozer for use with:

NAME _____

TITLE _____

COMPANY _____

STREET _____ CITY, STATE _____

TYPE OF WORK _____

☐ Bulldozer ☐ Snow Plow

☐ Angledozer ☐ Side Crane

☐ Carryall Scraper ☐ Rooter

☐ Logging Winch ☐ Rollers

☐ Tree Pusher ☐ Root Rake



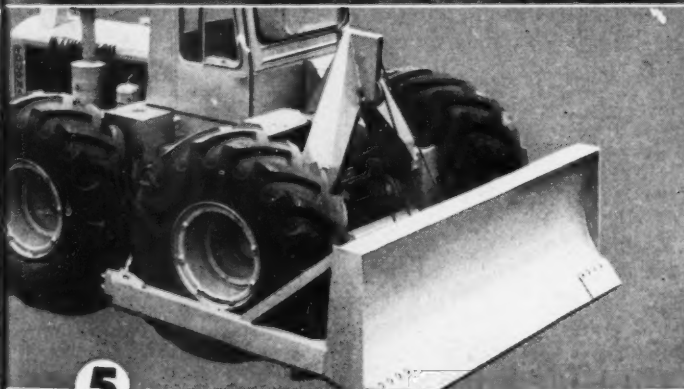
***TOURNADOZER* will do more work for you**



HANDLES 7 MAINTENANCE JOBS IN 10 HOURS —

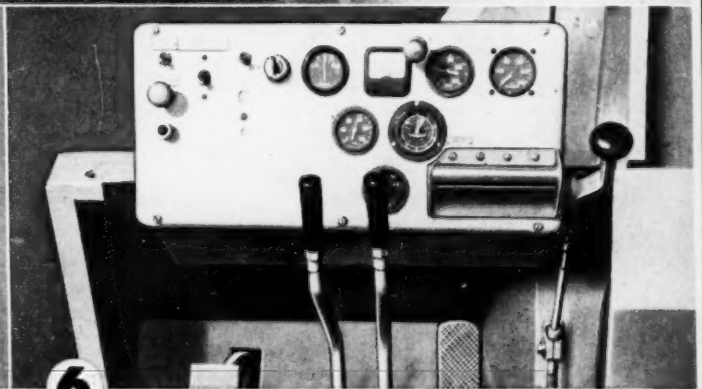
At their Genoa open-pit iron mine near Eveleth, Minn., E. W. Coons Co. has assigned a number of widely scattered jobs to one C Tournadozer. In a typical 10-hr. shift, the hustling rubber-tired "C" maintains 2 overburden dumps, stockpiles lean ore, cleans up around 3 large stripping shovels, and handles haul road maintenance. Compared to ordinary crawler operation, Tournadozer's work-and-run ability makes every hour productive for profits.

Copyright © 1965 Case Corp. Angle dozer, Reuter—Trademark Reg. U.S. Pat. Off. C136



5

FAST ELECTRIC-CONTROL BLADE—Powerful, electric-control PCU plus smooth, accurate, short-coupled cable connection gives better blade control to match high dozing speed. 44" lift . . . unlimited drop . . . 5" tilt at either end. 11' 2" x 3' 7" bowl fills fast, drifts big 2 1/2-yd. load.



6

EASY TO OPERATE—Compressed air takes the work out of Tournadozing. Simple controls are air-actuated . . . easy to reach. Operator sits up front ahead of engine . . . can see where he's going, what he's doing. No stretching, no twisting, no end-of-day fatigue slow-down.

LETOURNEAU
PEORIA, ILLINOIS

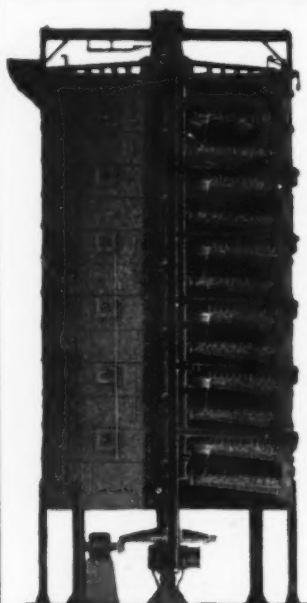


TOURNADOZERS

IT'S RUBBER THAT PUTS THE ACTION IN TRACTION



MULTIPLE HEARTH FURNACE

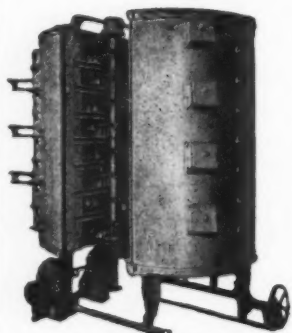


SIZES 8' 6" TO 22' 3" DIAMETER
NUMBER OF HEARTHS, 1-16

ROASTING CALCINING DRYING

| | |
|----------------|-------------|
| ZINC ORES | QUICKSILVER |
| IRON ORES | MAGNESITE |
| COPPER ORES | LIMESTONE |
| TIN ORES | MOLYBDENUM |
| NICKEL ORES | BONE CHAR |
| LEAD ORES | DIATOMITE |
| SODA ASH | LIME SLUDGE |
| FULLER'S EARTH | MAGNESIUM |
| CARBON | CLAY |
| PYRITE | GRANULES |
| | ANTIMONY |

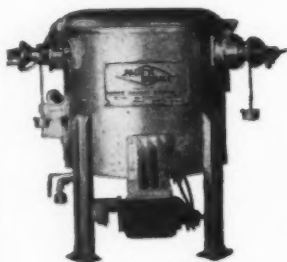
SELENIUM
SEWAGE SLUDGE
LEAD CHEMICALS
METALLIC SLUDGES
FILTERING MEDIA
AND FOR NUMEROUS
OTHER MATERIALS



Pacific Laboratory Furnace

PACIFIC LABORATORY FURNACE

Manufactured in two sizes—36" and 54" inside diameters having 6-8-10 Hearths and include the same features as the commercial size furnace.



Pacific Furnacing Unit

NEW PACIFIC FURNACING UNIT

Higher shell height. Three gas burners. Provision for conversion to muffle unit. Small volume roasts at any desired temperature.

PACIFIC FOUNDRY COMPANY LTD.
Engineers and Metallurgists

1400 So. Alameda St.
Los Angeles

3100 19th St.
San Francisco

551 Fifth Ave.
New York

GRAB SAMPLES

From the Mail

Most Philippine Mining People Know WORLD MINING

Dear Sir:

Most mining men in the Philippines are acquainted with WORLD MINING or have access to it.

With reference to the magazine I might state that I find it covers the field adequately and its articles are not only of general interest but of decided value to mining engineers in the Far East.

V. A. Brussolo,
Vice President and Consulting Engineer
A. Soriano Y Cia,
Soriano Building, Manila, Philippine Islands

Enables Familiarity With the Latest Mining Technique

Dear Sir:

We are highly interested by WORLD MINING which enables us to be familiar with the latest achievement in the mining technique. We do thank you for having been kind enough for having sent it to us.

P. Adam,
Engineer
Service des Mines Tananarive,
Tananarive, Madagascar

Enlightening Coverage of Alluvial Mining

Dear Sir:

We wish to acknowledge regular receipt of WORLD MINING issues, mailed by yourselves, and to express our appreciation of them.

We find WORLD MINING most interesting and enlightening, particularly in the coverage of alluvial mining subjects generally, and would be pleased to continue receiving monthly copies.

V. Pratt,
General Manager,
The Endurance Tin Mining Co., N. L.,
South Mount Cameron, Tasmania, Australia

Technical Articles and Varied and Up-to-Date News

Dear Sir:

I wish to express my sincere thanks for the kindness in mailing me regularly this useful magazine, WORLD MINING. I have found it extremely helpful for me as well as for students. This is the one magazine I have found which, along with technical articles, provides such varied and up to date news about the mining profession in the whole world.

P. L. Agrawal,
Assistant Professor
College of Mining and Metallurgy,
Benares, India

Readers Would Like to Know, Too

Dear Sir:

My attention has been called to the statement in the August issue of MINING WORLD (Asian Section of International News—pages 59 and 63) that India is replacing silver coins with cupro-nickel coinage. I thought that you would like to know that pure nickel coins, not cupro-nickel, are being used in that country to replace the silver coins being withdrawn from circulation.

As a matter of fact, the new Indian coins are being struck at the Bombay and Calcutta mints on pure nickel blanks supplied by International Nickel Company's British subsidiary, Henry Wiggin & Company, Limited.

L. A. Fink
Manager, Public Relations Bureau
International Nickel Company
New York, N. Y.

World Mining Interesting

Dear Sir:

I had the opportunity of looking through a few copies of your WORLD MINING recently and found them interesting. Will you be kind enough to include me in the list of regular readers from this country and arrange to send me this periodical?

S. N. Ramnathan, A. I. S. M.
Inspector of Mines
No. 4 Circle
P. O. Kodarma, E. I. R.
Bihar, India.

MINING WORLD

WORLD MINING

The International Department of MINING WORLD

INTERNATIONAL PANORAMA

NEGAUNEE, MICHIGAN—The Jones and Laughlin Ore Company will begin work immediately to develop a new 1,000,000-ton per year underground iron ore mine on property bought in 1921 from the Breitung interests.

DENVER—A new retorting process has been developed for continuous extraction of oil from oil shale at the demonstration mine at Rifle of the U. S. Bureau of Mines. The new gas-combustion process requires neither water nor an elaborate condensing system.

CLEVELAND—The Republic Steel Corporation will spend \$75,000,000 to expand facilities for production of 672,000 net tons of steel annually.

DULUTH—The National Production Authority has issued an order to allocate 10,000 tons of steel per month during the first quarter of 1951 for construction work on 12 new Great Lakes ore carriers.

OSLO—Magnesium production will be started in Norway next year by the Heroya Electro-Kjemiske Fabrikker. Initial production, about 3,000 tons per year, will be exported.

HELSINKI—A large deposit of magnesite has been discovered in Finnish Lapland at Kaaritunturi.

WASHINGTON—The Atomic Energy Commission has selected a 250,000-acre site in South Carolina on which to construct new production plants.

SAO PAULO—A new steel rolling mill with a capacity of 1,500 tons of special shapes per month is being built by the Companhia Paulista de Laminacao, S.A.

SANTIAGO—South America's second largest steel mill at Huachipato has been formally opened. The first product was pig iron which was shipped to the United States.

PITTSBURGH—The Aluminum Company of America has reopened its aluminum production plants at Massena, New York, and Badin, North Carolina. About 55,000 tons of metal from the plants will be stockpiled by the Federal government during 1951.

LONDON—After a 10-year period during which the British government was the sole importer of chrome ores to England, the London Ministry of Supply announced cessation of centralized purchases on November 21.

PARIS—Unfinished steel production in France during September reached the all-time monthly high of 832,000 tons.

WASHINGTON—Consumption of cobalt in the United States during the third quarter of 1950 was the greatest quarterly consumption on record. A total of 2,126,138 pounds was used in the period.

TORONTO—Steeple Rock Iron Mines, Ltd., established a new iron ore production record during 1950 with shipments of 1,216,614 gross tons.

PITTSBURGH—Mill prices of various grades of pig iron have been raised \$3.00 per gross ton by four subsidiaries of the United States Steel Corporation.

JOHANNESBURG—A new manganese district has been discovered in South West Africa. Initial prospecting over a 20-mile length has indicated a deposit up to 150 feet wide having a grade of 49 percent manganese.

CLEVELAND—The Cleveland-Cliffs Iron Company has increased the prices for iron ore by \$0.60 cents per ton delivered at Lower Lake ports. Mesabi range non-Bessemer (51.5 percent iron) ore is priced at \$8.30 per ton.

PITTSBURGH—The Aluminum Company of America will expand its aluminum facilities to produce an additional 120,000 tons per year.

WASHINGTON—The Jones & Laughlin Steel Corporation has been awarded the first necessity certificates for expansion of production for defense purposes by the National Security Resources Board. The certificates allow accelerated tax amortization for new plants.

VIENNA—The new \$7,300,000 steel blooming mill at the Alpine Montan steel plant built with ECA funds has been opened.

NEW YORK—The spot New York price for mercury has been increased to a price equivalent of \$122.50 per flask f. o. b. New York.

TANANARIVE, MADAGASCAR—The Syndicat du Mica de Madagascar has sold 150 tons of phlogopite mica to the United States for stockpiling.

WASHINGTON—The United States government has entered contracts for 399,000 tons per year of aluminum under plant expansion and reactivation programs. This is an increase of 55 percent over present domestic output.

YOUNGSTOWN—The Youngstown Sheet & Tube Company will spend between \$8,000,000 and \$9,000,000 to increase ingot capacity by as much as 100,000 tons per year at its Campbell works open hearth plant.

WASHINGTON—The tariff on antimony and tungsten metal was increased on December 11th as a result of the President's proclamation terminating trade concessions with China. The tariffs were raised from one to two cents per pound for antimony and from 38 to 50 cents a pound of metallic tungsten in ores and concentrates.

OTTAWA—Cobalt sixty, a new radioisotope, has been developed as a better and cheaper substance than radium for use in industrial and medical radiology. It has been produced in Canada's atomic pile at Chalk River, Ontario.

NEW SOUTH WALES—The Bureau of Mineral Resources is checking specimens from the Broken Hill mines for uranium.

PITTSBURGH—Manganese imports for the steel industry from the Union of South Africa and the Gold Coast for the first six months of the year were greater than the entire 1949 imports from those countries.

Michigan Firm to Develop Huge Copper Orebody

The Copper Range Company, operating in northern Michigan, U. S. A., plans to produce 37,500 short tons of copper per year from its White Pine property, according to Morris F. La Croix, president. The company will construct a mill, a metallurgical plant and a townsite.

The White Pine property contains one of several huge, low-grade, orebodies in the U. S. which can be mined at reasonable cost if large-scale mining methods can be used. The total proven ore reserves at the property amount to about 300,000,000 short tons, a figure determined by several years of drilling.

The mill to be constructed will have an initial capacity of 10,500 tons of ore daily. Pilot plant experiments which have been carried on recently have proved that 85 percent of the copper in the ore may be recovered at a cost less than originally estimated.

Major Orebodies Found at Japanese Pyrite Mine

Three major orebodies have been discovered at the Yanahara pyrite mine owned by the Dowa Mining Company, Okayama Prefecture, Chugoku District, Honshu, Japan. The main orebody at this mine is a massive deposit of three connecting orebodies, extending a maximum of 1,000 meters in dip length, and 170 meters wide. The first of the new discoveries, the Hisaki, is 800 meters northwest of the main orebody, extends 200 meters in length, is 20 meters thick, and 50 meters in dip length. The second discovery, the Yasumiishi, is 1,000 meters northwest of the Yanahara and consists of three parallel beds, one five meters thick, one 30 meters thick, and the third 20 meters thick. The over-all length of this group is 80 meters. Depth is 100 meters as far as is known. The third orebody, the Nishi, was found 300 meters west of the main orebody by drilling, and work is under way to determine its size.

The company will develop all the new zones; mechanization of underground transportation also will be done because of the favorable ore situation. During 1950, production from the mine rose steadily to 35,000 metric tons of pyrite monthly, containing 50 percent sulphur. The sulphur took care of 27 percent of Japan's sulphur demands for the year.



The small uranium mine in the center of the picture is on the rim of a canyon along which the ore crops out. It was found by a prospector, but diamond drilling has been proved most satisfactory in finding concealed ore beneath the higher benches away from the canyon rim.

URANIUM MINING IS PRIMARILY A FIELD FOR SMALL OPERATORS

By William E. Haldane

Consulting Engineer
Grand Junction, Colorado

Uranium-vanadium mining on the Colorado Plateau is one type of mining where there is a need and place for the small miner. There are many deposits which can and have been mined most efficiently and profitably by the small operator. So successful has been the program of government-guaranteed price and markets for his ore as well as some diamond drilling aid that there are now more than 200 separate mining operations employing over 1,000 men. The small miner has been of great importance on the Colorado Plateau. He can and will continue to play a most important part in the production of minerals for national defense.—Ed.

Uranium mining on the Colorado Plateau is characterized by small operations. Several thousand tons of low-grade carnotite ore is mined and shipped each month to the processing plants at Monticello, Utah; Durango, Naturita, Uravan, Rifle, and Grand Junction, Colorado. The bulk of the production comes from a large number of small operators that ship from a few tons to rarely over 400 or 500 tons a month. The operators either own their own claims or lease from other individuals or companies. The large milling companies—namely, the United States Vanadium Corporation, Vanadium Corporation of America, and Climax Uranium Company—lease most of their mining property, generally in small parcels, such as

a mine, a claim, or occasionally a small group of claims. A smaller group of operators is leasing on claims owned by the Government.

Deposits Make Small Mines

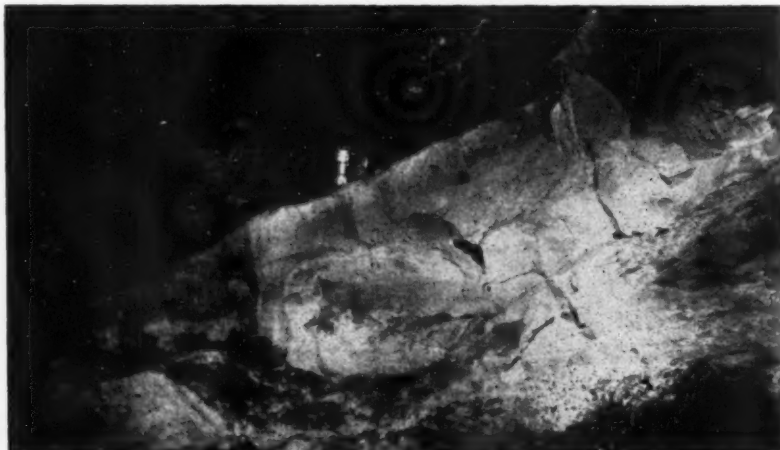
The primary factor influencing the small operations is, of course, the type of deposits. The most common uranium-vanadium mineral is carnotite, $K_2O \cdot 2U_2O_5 \cdot V_2O_5 \cdot 3H_2O$, which is found in spotty and erratic deposits in the Salt Wash member of the Morrison formation of Jurassic Age over hundreds of thousands of acres of the area known as the Colorado Plateau in southwestern Colorado, southeastern Utah, northeastern Arizona, and northwestern New Mexico. The deposits vary greatly in size and mineral content. The area as a whole

contains the third largest and possibly the second largest known deposit of uranium in the world.

The present theory as to the formation of the deposits is that they are a result of the circulation of ground waters in the Salt Wash member of the Morrison after the deposition of the Salt Wash sands and shales, but prior to the deposition of the heavy shales of the Brushy Basin member of the Morrison and the sandstones of the Dakota formation. There are several contributing factors that also influence the spottiness of the deposits:

- (1) A necessary source material broken down and taken into solution.
- (2) Ground water circulation of these mineral-bearing solu-

Many orebodies have a definite "roll" as shown in this picture. The relatively high grade black-colored ore is shown above the carbide lamp. The lighter colored barren sandstone is below the lamp. The curved contact between ore and waste is sharp and definite.



[World Mining Section—8]

tions along lines of least resistance, such as bedding planes, fractures, unconformities, or through a relatively porous sandstone, and limited by relatively impervious shale lenses and layers.

- (3) The presence of a precipitating agent, such as carbon or iron and calcium oxide.
- (4) The proper conditions as to temperature, pressure, and pH.

Thus, the deposits vary greatly in size and in the amount and proportion of mineral content. Deposition seldom occurs in any definite pattern, although there are definite trends both locally and over the area as a whole.

Of secondary importance among factors influencing the small operations is the fact that operators familiar with the type of deposits and mining methods have not had the capital to invest in additional equipment and property. Until recently, the area has not been particularly attractive to outside capital.

Three Periods of Mining

The exploitation of the area began shortly after the turn of the century, has passed through two distinct phases, and is now approaching the peak of a third. The first phase was the production of radium from high-grade uranium ore found in small lenses, pockets, and where trees have been replaced by uranium oxide. Production was limited almost entirely to rim and surface deposits, and the uranium and vanadium were more or less useless by-products. The United States produced the majority of the world's radium from these deposits until 1923, when production of the high-grade Belgian Congo pitchblende made it impossible to compete in the world market.

The second phase began in the mid-thirties when the demand for vanadium as an alloying agent in steel increased. Production came mostly from extensions of the rim and surface deposits, although with the proximity of war fairly extensive diamond drilling programs were carried on by the large companies in locating ore extensions beyond the old workings.

The third phase began in 1942 with the advent of the Atomic Energy Commission's program. The old tailing piles were retreated for their uranium content, and in 1948 the Atomic Energy program came into effect. The program was designed to stimulate domestic production of uranium-bearing ores. The stimulation for this area was in the form of a price schedule for carnotite-type uranium ores containing over 0.10 percent U_3O_8 . Additional concessions were made by the Government by paying a development allowance of fifty cents per pound of contained uranium oxide and by absorbing most

of the cost of hauling the ores to the purchasing depots. This amounted to six cents a ton per mile up to one hundred miles. There is no doubt the program—namely, the setting of a price for the uranium content of the ores—has stimulated production over the area, but the benefit to the individual has not been great. For example, during the past two and one-half years the Atomic Energy Commission and the United States Geological Survey have contracted in the neighborhood of 750,000 feet of diamond drilling. The majority of the drilling has been done on Government-owned claims or on land withdrawn from entry or on property controlled by the larger companies. Lessees get the benefit of developed or partially developed ore, but the royalty terms are correspondingly higher. What drilling has been done on the smaller privately owned ground was almost entirely exploratory drilling and no effort was made to block out and define the limits of the orebodies. The existing price schedule is adequate for developed or even partially developed orebodies, but a greater incentive will be needed for future exploitation of the area, either in the form of higher prices for the uranium and vanadium content or increased aid in the exploration and development of the area. Private enterprise cannot carry

on extensive exploratory and development programs at this time.

A Small Mine Operation

Typical of many is the operation being carried on at a Government-owned group of claims in the Slickrock, San Miguel County, Colorado area, approximately 45 miles north-east of the Atomic Energy Commission's ore-buying depot and mill at Monticello, Utah (see MINING WORLD, April, 1950). The group is composed of eight contiguous claims. Two claims are under lease to one operator and four claims to another. Production from the six claims is in the neighborhood of 500 to 600 tons of average grade ore a month. The ore comes from four separate mines; two other mines are under development.

The claims were originally located in 1915, but until the mid-thirties only a few tons of high-grade ore were mined. Between 1935 and 1943 an estimated 3,000 tons was mined, mostly from rim deposits. In 1943 the U. S. Bureau of Mines, in conjunction with the Metals Reserve Company's program, diamond drilled 40 or 50 holes along the rims and adjacent to the old workings. Although some ore was found, no orebodies were discovered that were large enough to justify the expense of development. The claims were acquired by the Government in 1945.

A 15° inclined shaft is being mucked out with an Allis-Chalmers HD5 Tractoshovel at this small Colorado uranium mine. Use of the Tractoshovel is a fast and cheap way to load and transport either ore or waste to bins or to the waste dump in one operation.



In 1948 the Atomic Energy Commission began an extensive diamond drilling program in this area under the guidance of the U. S. Geological Survey. The exploratory and, in effect, wildcat drilling located several orebodies in the benches and areas away from the rims. The orebodies were not blocked out, but enough off-set holes were made around some of the ore-bearing holes to justify mining operations. All the present mining operations are on the orebodies discovered by diamond drilling and on areas away from the rims; however, the rim areas on this particular group of claims are still potential uranium producing areas. In spite of the fact that the group has been extensively drilled, a great deal more drilling will be necessary in the future. The high cost of diamond drilling prevents the closely centered drill patterns that are often necessary.

Mining operations on this group under the Atomic Energy program began in the summer of 1949. The first production came from the extension of the old workings and rim deposits, but development work in the form of driving inclined shafts to the newly discovered orebodies was started. As soon as the new orebodies were well into production, still other development projects were started so that development was always ahead of the mining. At the present time, production is coming from three of the inclines, another of the inclines has been mined out, and two are in the process of development.

Small Miners Follow the Ore

The largest mine of the group, Incline No. 1, produces about 300 tons of ore a month. The ore occurs in three different horizons, one at a depth of 45 feet below the surface of the ground, one at 55 feet, and one at 70 feet. The ore beds roll, pinch and split, and at one point in the mine the three came together, making an 18-foot face of ore. Frequently the bottom bed plunges below the track



Typical small mine workings are seen along the canyon rim. Ore is mined from several strata. The thin-bedded ore may be seen in the pillar at left and above the lowermost adit.

level, necessitating additional hoisting underground, and the middle bed will roll up into the back causing a high back and excessive waste removal. Ore headings with diamond drill holes ahead can be mined according to plan, but as soon as the drill holes have been passed by mining, the only alternative is to follow the ore and the leads in their erratic meanderings.

The ore is mined in a way that will necessitate as little sorting as possible, namely, in an ore heading the thickest member, whether ore or waste, is drilled, shot and mucked out; and then the other is removed. In order to maintain as steady a production as possible, the various headings alternate: ore, waste, ore, and waste. Development headings are generally drilled one day and mucked out the next. All ore and waste is hoisted up a 24° incline to the surface. There is no ventilation problem

A face of high grade uranium-vanadium ore is shown in this underground picture. Below the pick is sandstone waste. The heading has been mucked out by Tractoshovel. Separately the ore and then the waste are drilled, blasted and mucked out.



at Incline No. 1. A 6 by 6 foot raise to the surface on one side of the mine, an eight-inch churn drill hole on the other side, and the large main stone connected through to the incline, keep a good circulation of fresh air underground.

Mechanized Operations

The equipment in use at Incline No. 1 includes the following: two Gardner-Denver S48W jackhammers, two Gardner-Denver jacklegs, five one-ton mine cars, one Ingersoll-Rand hoist for underground hoisting, one gas engine inclined hoist, one Eimco Rockershovel mucking machine, one Ingersoll-Rand 315 Diesel compressor, one Kohler 1,500-watt light plant, one 500-gallon water tank.

In connection with the same lease, Incline No. 3, which produces about 100 tons of ore a month, has the following equipment: one Gardner-Denver S48W jackhammer, one Gardner-Denver jackleg, one Ingersoll-Rand 210 Diesel compressor, one Allis-Chalmers HD5 Tractoshovel, which alternates between Inclines No. 3 and No. 4.

Incline No. 4, which is being driven to a new orebody, has the following equipment: one Gardner-Denver S48W jackhammer, one Gardner-Denver jackleg, one Ingersoll-Rand 105 Diesel compressor.

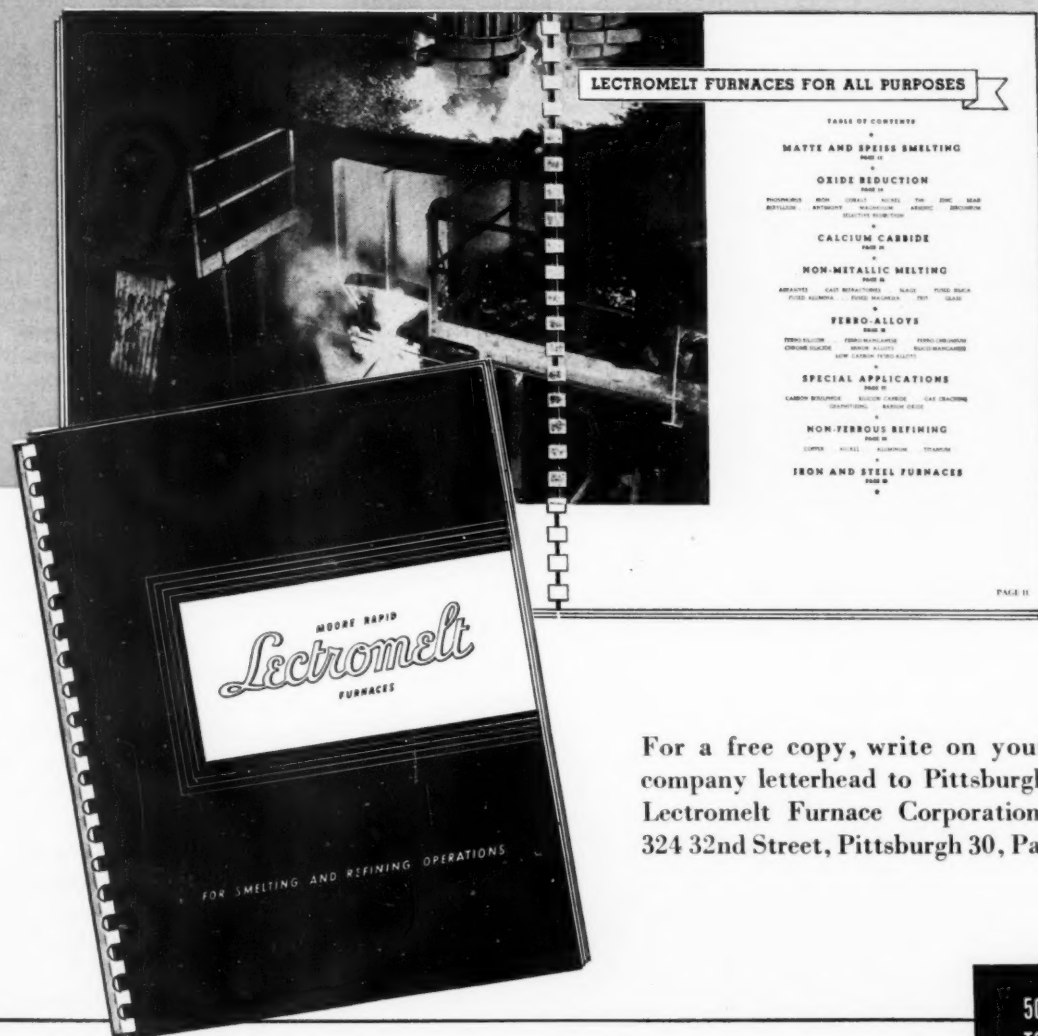
Very few operators in the area use electric lights underground, but the advantages of better light as well as increased safety are well worth the investment of a small light plant. The miners still use their carbide lamps but generally need them only in the advanced headings.

The use of the Allis-Chalmers HD5 Tractoshovel for driving the inclines and for underground mining has the advantages of being a fast and inexpensive way of handling waste and ore. The disadvantages are longer inclines (a 15° slope versus a 24° slope, which is customary with hoists) and larger drifts (a 9 by 9 foot versus the customary 5 by 6 foot). Ventilation is also a problem. The Diesel fumes are irritating at first to some, but have no toxic effect if the air underground has any circulation at all.

Small Mines Have a Future

The Colorado Plateau has vast quantities of uranium in the low grade, widely disseminated, carnotite ores. The type of deposit has limited the scale of mining in the past and there is little doubt that the largest part of the production will continue to come from the many small operators. However, in order to maintain the present rate of production, the small operator is apt to need help. Over a period of the last ten or fifteen years many operators have made a living, a few have made a comfortable living, but no one has accumulated wealth from the actual mining of carnotite ore.

if you're interested in doing any of
these things with an Electric Furnace,
you need this new book



For a free copy, write on your
company letterhead to Pittsburgh
Lectromelt Furnace Corporation,
324 32nd Street, Pittsburgh 30, Pa.

WHEN YOU MELT... **MOORE RAPID**
Lectromelt





Team for fast loading



LOOK UNDER THE HIDE

Connecting rods for "Caterpillar" Diesels are made of medium carbon steel, drop forged and heat treated. Of "H" section design, they are rifle drilled to provide oil passage to the piston pin, and to oil-cool the piston. Connecting rods are balanced to close limits. Crankpin bearings are solid aluminum alloy, precision type. Piston-pin bushings are bronze and are precision bored. Look under the hide for built-in quality.

CATERPILLAR

DIESEL ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

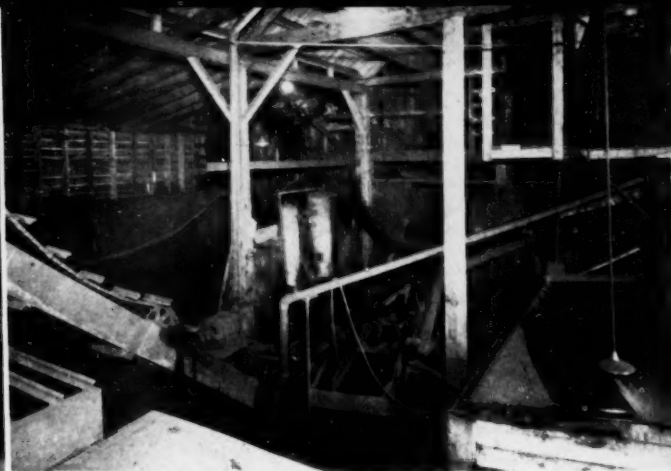
TIME saved is indeed money earned when the job is loading pay material. Time-saving is biggest when you have power that not only works fast but works steadily . . . for down-time, on the other hand, can easily turn savings into losses. The loss doubles when the job requires a team of interdependent machines — for when one goes down the other becomes inactive too.

The Federal Chemical Company (Tennessee) minimizes such happenings by using dependable power: "Caterpillar" Diesel. For loading phosphate rock from a 2-acre storage pile onto railroad cars (see picture), a "Caterpillar" D7 Tractor 'dozes the material to a drag-line powered with a "Cat" D13000 Engine. An average of 112 ton-yards keeps piling into 50-ton railroad hopper cars per hour. Outstanding operating advantages, according to Federal's Tom S. Miller, are speed and very little down-time. " 'Caterpillar'-powered equipment," he adds, "fills the bill best for us under the trying conditions of phosphate mining."

Leading manufacturers of all types of mining and excavating equipment have engineered their machines to be powered by "Caterpillar" Diesels. You can standardize on power by specifying "Caterpillar" Engines on your machinery purchase order.

Today the importance of "Caterpillar" products, both for military use and for maintaining the national economy, is greatly increased. Talk over your machinery requirements with your "Caterpillar" dealer. He has ample parts stocks to keep your present equipment doing its job and will do his utmost to make prompt delivery of new machines.

CATERPILLAR, SAN LEANDRO, CALIF.; PEORIA, ILL.



LEFT: In a view looking easterly, the new aluminum-covered mill building stands out against its backdrop of trees. Ore enters at the top and flows by gravity through the mill; concentrates are stored in two bins in the lower-left foreground—one for battery and one for metallurgical grade. RIGHT: The interior of the mill is shown here in the last stages of building construction. Middling from the Deister Concentrator Company "SuperDuty No. 6" table flows to the Morse Bros. rake classifier and is then elevated by dewatering drag (left foreground) to a rotary drier.

TROUT REBUILDS MANGANESE MILL

Burned to the Ground, Back in Production Twelve Days Later, the Trout Mill at Philipsburg, Montana, Has Increased Capacity to 75 Tons Daily

An important characteristic of the small mine organization is the fact that it can and does act quickly. Operations are flexible—are changed on the job as conditions dictate. The Trout Mining Division is a typical example of a small mine making an important contribution to the United States' defense effort.
—Ed.

A burning mill is one of the saddest sights that a mine manager can ever see. That's exactly what Les B. Manning, manager of American Machine & Metals, Inc., Trout Mining Division, saw on the night of January 4, 1950. The Trout mill at Philipsburg, Montana, the district's original wet-milling installation for manganese-dioxide ore, burned to the ground.

The day after the fire, Manning, Roy McLeod, general superintendent, Roy V. Hamilton, metallurgist and construction foreman, and Bernard LeRoy, mill superintendent, surveyed the results of the fire. The building and its concrete foundation, all conveyor belts, and the electrical equipment, including motors and magnetic separators, were a complete loss.

Decision—Rebuild Quickly

This was Trout's situation: It was selling manganese-dioxide products to the U. S. government's Bureau of Federal Supply, the largest of three purchasers, which was buying battery-grade concentrates of 68.5 percent MnO_2 for the domestic stockpile; to the E. J. Lavino & Company, buyer of battery-grade manganese dioxide, which was purchasing a 65.0 percent concentrate for resale to dry-cell manufacturers; and to Sullivan Min-

ing Company, which was purchasing approximately 500 tons of metallurgical-grade (30 to 65 percent) concentrate each month for use as a cell cleaner in the electrolytic zinc plant at Wallace, Idaho. To halt production for long would probably mean a loss of one or more of these three markets. So the decision was made to rebuild the mill as quickly as possible, and specifically to resume production of metallurgical-grade concentrates before Sullivan Mining Company was forced to buy from a new source.

The board of four men decided to make one addition to the flowsheet, a dry-concentration section which would be used to process ore or tailing directly into marketable products without the use of wet gravity concentration; ore would be crushed, dried, recrushed, and finally concentrated by a magnetic separator.

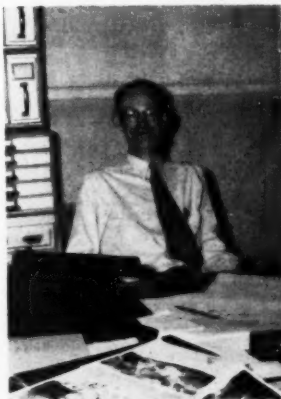
To buy the necessary equipment as soon as possible, the management group from Trout scouted the entire area around Philipsburg, looking for new and used machinery which would do the job. Some of the big pieces of equipment that could not be readily obtained from manufacturers were overhauled in place, purely as a time-saving factor.

Battery Grade in 40 Days

On January 16, just 12 days after the fire, the newly-added dry side of the Trout mill was in operation, producing a metallurgical-grade product for the Sullivan Mining Company.

On February 23, just 40 days after the fire, the mill was operating on both the wet and dry sides, and was producing 400 tons of battery-grade concentrates and 500 tons of metallurgical-grade concentrates monthly.

LEFT: Les B. Manning, manager of American Machine & Metals, Inc., Trout Mining Division, registers a happy smile in appreciation of his crew's fast work on the new mill. RIGHT: Standing beside the maintenance shop, mill superintendent Bernard "Bumo" LeRoy, general superintendent Roy McLeod, and metallurgist Roy Hamilton enjoy a good story.



Roy Hamilton next turned the full efforts of his construction crew to erecting a building around the equipment.

On March 25 the building was complete, a shiny new timber-framed, aluminum-covered building, far better than the former building, and with the most important addition—provision was made for a recently-installed automatic sprinkling system and a water-storage tank to quench rapidly any fire which might start.

Regarding the way in which his men pitched in to rebuild the mill, Les Manning says: "Roy Hamilton deserves more praise than I can give him. Nearly always, he was just two nails and one board ahead of the carpenters with his plans."

Roy Hamilton says: "This is a working organization. Why, Les Manning himself came with us in the truck to Butte and helped load equipment for the mill."

Roy McLeod says: "I never saw a group of men pitch in so willingly and do a tough job under tough conditions. Remember that in January and February we call 10 degrees above zero warm weather."

General Plan of Milling

Trout ore, as it comes from the several small mines and leases in the area, is divided into two classes: The first class, "sticky" ore, contains enough fine siliceous material and other impurities to require it to be run through the wet-milling process to meet battery-grade specifications.

The second class, "ore which is not sticky," is free enough from impurities to be concentrated by crushing and magnetic separation.

Briefly, the plan of milling is that the "sticky" ore, approximately 50 tons daily, goes to the wet side, is crushed, and classified at 60-mesh. The minus-60-mesh product goes to a concentrating table, and the plus-60-mesh product goes to a 3-cell jig. Concentrates from both the table and the jig are of battery grade. Middlings from both the table and the jig are dried, recrushed, and treated by magnetic separation to produce a battery-grade concentrate, a metallurgical-grade concentrate and a tailing.

Ore which is not "sticky," approximately 25 tons daily, goes to the dry side, is finely crushed and sent directly to the final-retreatment circuit of the wet side. There it is dried, recrushed, and magnetically concentrated.

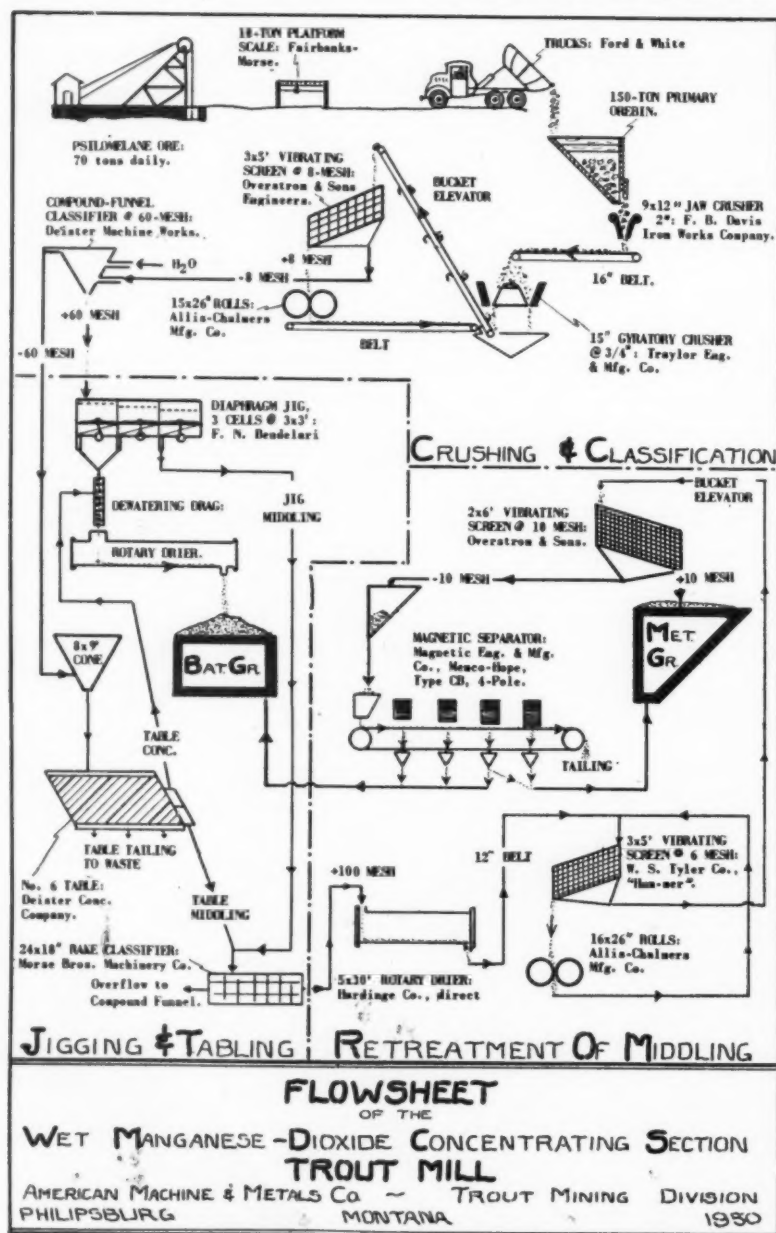
Wet Mill by Jig and Table

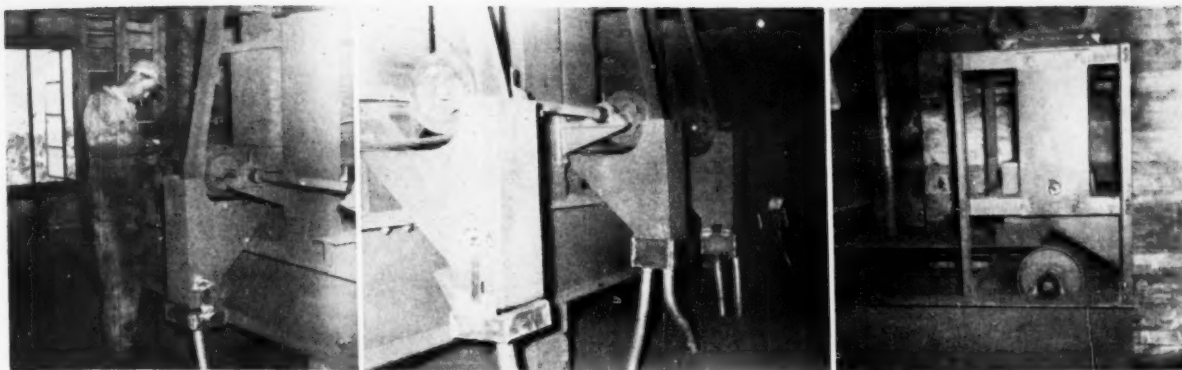
Drivers truck ore from the mines, weigh their loads on an 18-ton Fairbanks-Morse platform scale, and dump the ore into the 150-ton primary orebin. In the primary crushing circuit, ore is crushed to minus-2-inches by a 9 by 12 inch F. B. Davis Iron Works jaw crusher, is then reduced to minus-3/4-inch by a 15-inch Traylor gyratory, and is then crushed to minus-8-mesh in a circuit consisting of 15 by 26 inch Allis-Chalmers rolls and a 3 by 5 foot Overstrom vibrating screen.

The minus-8-mesh product is separated at 60-mesh by a Deister Machine Company compound-funnel classifier. The products of this hydraulic classifier are fed for individual treatment to the jig and table circuits.

The coarse (plus-60-mesh) product of the classifier is fed to the first cell of a Bendelari, 3-cell, 3 by 3 foot diaphragm jig. Spigot products from the first two cells, being of battery grade, are lifted by a dewatering drag to a 3 by 20 foot indirect rotary drier. The dried product is stored, recrushed by 12 by 18 inch Colorado Iron Works Company rolls, and marketed as a battery-grade concentrate either to the Bureau of Federal Supply or to E. J. Lavino & Company. The jig middling, the spigot product from the third cell, is sent to the final retreatment circuit where it is joined by the table middling.

The fine (minus-60-mesh) product from the compound-funnel classifier is thickened in an 8 by 9 foot settling cone and sent to a Deister Concentrator Company "SuperDuty No. 6" (approximately 72 inch by 12 foot) Diagonal-Deck concentrating table. The table concentrate, being of battery grade, is sent to the dewatering drag where it joins the jig concentrate. The table middling joins the jig middling in the Morse Bros. Machinery Company 24 inch by 18 foot





LEFT: Mill superintendent Bernard LeRoy checks the tailing from the Memco-Hope, Type CB magnetic separator. The grayish-white tailing usually contains less than 8 percent of manganese dioxide. CENTER: Manganese dioxide, attracted to the poles of the Memco-Hope magnetic separator, is carried from the poles to the four chutes just to the right of each pole. The center two poles utilize a divided receiving chute to catch a high- and a low-grade concentrate. RIGHT: This feed arrangement to the main belt of the magnetic separator serves two purposes: The gate feeder, adjusted by ratchet control, spreads feed evenly across the 18-inch main belt. The revolving magnetic drum removes iron which would pile up under the poles and tear the belting.

rake classifier, the first piece of equipment in the final retreatment circuit.

Dry and Crush for Magnets

The Morse Bros. classifier, used as a thickener, returns overflow (minus-100-mesh) to the compound-funnel classifier, and sends the thickened (plus-100-mesh) product to a 5 by 30 foot Ruggles-Cole, direct, fuel-oil-fired rotary drier, where it is joined by the crushed product from the dry side. Crushed to minus-20-mesh by a circuit consisting of 16 by 26 inch Allis-Chalmers rolls and a 3 by 5 foot Tyler "Hum-mer" vibrating screen, the combined dried-middling and dry-side product is bucket-elevated to a 2 by 6 foot Overstrom vibrating screen and separated at 10-mesh.

The plus-10-mesh product is stored for shipment to the Sullivan Mining Company as a metallurgical-grade manganese dioxide; used as a cell cleaner, the metallurgical-grade product can and does contain reasonably high impurities of lead and zinc, and is too low in grade to meet battery specifications.

Memco-Hope Magnetic Separator

The minus-10-mesh product is sent to a Memco-Hope magnetic separator manufactured by Magnetic Engineering and Manufacturing Company, Clifton, New Jersey. The separator uses four extremely powerful electromagnets—the first pole in 50,000 AT, the second 50,000 AT, the third 100,000 AT, and the fourth 150,000 AT. These poles are so strong that they will pick up finely-divided very weakly magnetic manganese dioxide, which has a relative attractability of 0.71 on a scale in which iron is 100.00, corundum is 0.83, and quartz is 0.37.

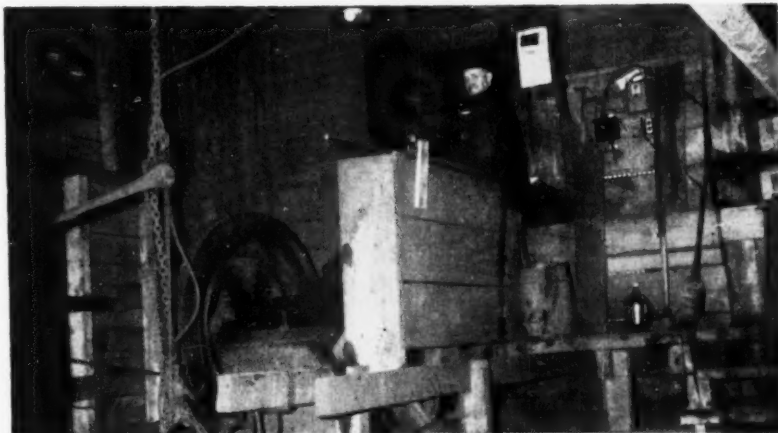
Mechanically, the Memco-Hope separator works like this: Ore, sized to minus-10-mesh, is spread evenly in a 1/10 inch layer across the width of the 18 inch main belt. The main belt carries it successively under the four magnetic poles; weakest in intensity, the first pole is also run at a

greater distance from the main belt (approximately 1/4 inch), and so picks up only the purest and most finely divided manganese dioxide. The cross belt running under the first pole carries the attracted ore particles sideways on the under side of the belt; as

soon as the cross belt carries it to a point outside the intense magnetic field, the manganese dioxide falls by gravity into the receiving chute. The three remaining poles, successively stronger, are also run successively

Continued on Page 59

TOP: Crusherman Gus Lindstadt adjusts the feed to the F. M. Davis Iron Works Company 9 by 11 inch primary jaw crusher. The crusher, set at 2 inches, receives feed by gate control from the 150-ton primary orebin. BOTTOM: Metallurgist Roy V. Hamilton checks the bed of cell No. 1 of the Bendelari 3-cell, 3 by 3 foot diaphragm jig. The jig, used to produce directly a battery-grade concentrate, is fed the coarse product from the Deister Machine Company compound-funnel classifier on the left.



RUGGED is the word for WEMCO SAND PUMPS

—rugged enough to take the beating of constant, heavy-duty service with that extra measure of dependability so vital to profitable milling.

WEMCO Sand Pumps have proved their dependability and economy by continuous, efficient operation under every variety of pumping service.



ONLY A FEW MINUTES are required to service and maintain a WEMCO Sand Pump. The easy accessibility to wearing parts provided by the WEMCO design is an important factor in keeping service interruptions and maintenance labor costs to a minimum. Clearance adjustments are quickly and easily made so that high pumping efficiency is constantly maintained.

IMMEDIATE DELIVERY OF WEMCO Sand Pumps and replacement parts is assured from various WEMCO warehouse stocks.

PRINCIPAL OFFICES

San Francisco • Sacramento • Salt Lake City • Spokane
Pocatello, Idaho • Denver • Phoenix • Tucson • Chicago
Hibbing, Minnesota • Bartow, Florida • New York

EXPORT DISTRIBUTORS

The Ore and Chemical Co.
80 Broad Street • New York 4, N. Y.

Continental Europe and North Africa

Dr. Ing. Herbert Lickfett, A. B., Stockholm 3, Sweden
S. E. M. U. Paris, France
Ferdinand Egeberg & Company, Oslo, Norway
Hides, Milan, Italy
A. Schubert & Company, Basle, Switzerland
G. Maltiniotis & Co., Athens, Greece
Agence Minière & Maritime, S. A., Antwerp, Belgium
Adil Gabay & Albert Koenka, Istanbul, Turkey
Philippine Industrial Equipment Co., Manila, Philippines
Fraser & Chalmers (S. A.) Ltd., Johannesburg, South Africa

WEMCO

WESTERN MACHINERY COMPANY

760-766 FOLSOM STREET • SAN FRANCISCO 7, CALIFORNIA

WKE (HMS) Mobil-Mill • Coal Spiral • Standard Thickeners
(HMS) Thickeners • (HMS) Media Pumps • Hydroseparators
(HMS) Densifiers • (HMS) Separatory Cones • "SH" Classifiers
Sand Pumps • Conditioners and Agitators • Fagergren Flotation
Machines • Dewatering Spirals • (HMS) Laboratory Units

AMERICAN DEVELOPERS & PROSPECTORS PLAN FEBRUARY MEETING WITH COLORADO MINERS

The international situation is so serious that the Colorado Mining Association is cooperating with the American Developers & Prospectors Association in sponsoring a joint mining convention in Denver, Colorado, on February 1, 2, and 3, 1951.

Everyone in the mining industry knows the importance of coordinated activity, and international attention is being directed toward the meeting and its results. Representatives from small mines all over the United States are especially invited, and the presidents and managers of many large companies have already made reservations.

Mike Cloonan, Colorado Fluorspar Corp., will be convention chairman; Norman Ebbley, superintendent of King Lease, Inc., is the vice chairman; Melvin Brugger, a consulting engineer, will be chairman of the Sowbelly Dinner; and George Teal, vice president and general manager of The Front Range Mines, Inc., is serving as chairman of the Gold and Silver Banquet.

Gold—International Interest

The gold section will be headed by Harold Worcester, assistant general manager of the Golden Cycle Corporation. Representatives of the Gold Standard League have agreed to be present for the gold discussions. Several outstanding economists are being brought to Denver to formulate a plan to nudge the Government out of its conservative position on gold. Full cooperation has been promised by foreign gold producing countries.

AEC and USGS Uranium Cooperation

The Atomic Energy Commission has promised Blair Burwell, general manager of the Climax Uranium Company and chairman of the uranium section, unusual cooperation in the planning of the uranium section. Up-to-the-minute geological information on the reserves of uranium ore in the Colorado Plateau will be discussed by R. P. Fischer, geologist, U. S. Geological Survey.

Special arrangements have been made to demonstrate at the convention the fluorimetric method of analysis for uranium, involving the use of the transmission fluorimeter. The demonstration will be performed by Irving May and Mary Fletcher of the U. S. Geological Survey, who have developed the transmission fluorimeter. Printed reports of vital inter-



Mike Cloonan
Convention Chairman



Blair Burwell
Uranium Section
Chairman

est to those concerned with the development of uranium will be available for the first time at the meeting.

Silver and Geology

Charles Chase, executive vice president of the Shenandoah Dives Mining Company, will serve as chairman of the silver section. The repeal of the Silver Purchase Act will be discussed by an outstanding representative of the National Economists Committee on Monetary Policy. This will be the first time that a representative of this group has addressed a mining convention.

The geological section is being coordinated by Dr. A. H. Koschman, geologist, U. S. Geological Survey. Emphasis will be placed on geological discussions of the extent of the mineral wealth of the United States in an attempt to show that the United States can become largely self-sufficient in minerals if proper encouragement is given to the mining

industry, in particular the smaller segment of the industry.

Dr. V. P. Sokoloff of Johns Hopkins University will present a paper, titled, "Soil Revitalization," about the mutual interest of miners and farmers in trace minerals.

The section on milling practice and procedure, under the chairmanship of M. E. Newlove, general manager of the Resurrection Mining Company, will bring outstanding milling and smelting authorities to Denver for technical reports and discussions.

In view of the importance of proposed modifications in the Securities and Exchange Act, the Commission has agreed to send representatives to Denver for the meeting.

The importance of steel in the national economy will be discussed by a prominent representative of the American Iron and Steel Institute.

Government Regulations

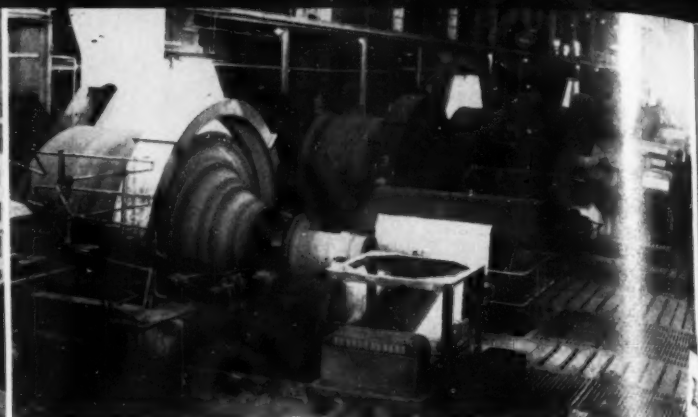
Oscar Johnson, president of the Idarado Mining Company, will serve as chairman of the government regulations section. The numerous federal regulations which vitally affect the mining industry will be discussed by authorities in their respective governmental fields.

Complete Program

A complete technical session, a section on nonmetallics, and the outstanding oil shale mining section will be presented again.

Left to right: George Teal, Gold & Silver Banquet Chairman; Harold Worcester, Gold Section Chairman; John Hamm, Colorado Mining Association President.





LEFT: View from hotel window in Johannesburg, South Africa. Note the huge tailing piles in the background. RIGHT: Eleven 10 foot by 72 inch Hardinge conical ball mills at Mufulira Copper Mines, Ltd., Mufulira, Northern Rhodesia.

FLYING IMPRESSIONS OF AFRICA

By Harlowe Hardinge

President, Hardinge Company, Inc.

Mr. Hardinge recently returned to the United States from a flying visit to Europe and Africa. A brief report on some of the mining companies and their operations that he visited has been prepared by him for Mining World's readers.—Ed.

We arrived at Leopoldville, Belgian Congo, which is on the Congo River, several hundred miles upstream from the sea, and is where the Congo ceases to be navigable. Across the river from Leopoldville is Brazzaville, a city of French Equatorial Africa.

An interesting thing about the Belgian Congo is that it is the only country I visited that required a certification from the police department that my police record was good and a letter from my employer that I was an honest, upstanding citizen. Being my own employer, I got my bank to write me a letter which served the purpose.

Later I took another plane to Elizabethville, which is 1,200 miles away and in the southeastern portion of the Belgian Congo. Elizabethville is also a very modern city and is where the main offices of the Union Miniere du Haut Katanga are.

The Union Miniere du Haut Katanga is truly a fabulous enterprise. It has been said it is fourth in the production of copper in the world; first in the production of cobalt; and apparently first in production of uranium; at least, the uranium obtained in the Congo is comparable in quantity with that obtained in western Canada. Union Miniere also produces zinc, manganese, tungsten, cadmium, gold, platinum, palladium and other metals in lesser quantities. There are

a total of 26 Hardinge mills and 11 Ruggles-Coles dryers in its plants, three of which I visited. I arrived on a Friday afternoon, had conferences with various officials Saturday, and they were anxious to discuss so many subjects that we went to Jadotville, 85 miles away by automobile, and had all day conferences there and inspection at their mill and refineries on Sunday.

Ore values at Union Miniere are much higher than in the Rhodesian "copper belt" but are perhaps not as extensive. In any event, the so-called low grade copper ore is around 4.0 percent. The better grade copper ore runs up to 28.0 percent copper and there also is from 12 to 15 percent zinc in the same ore body. The combination necessitates floating the zinc from the copper to make smelting possible and economical. The company has a number of very large properties that it is developing, spread over an area of 500 or 600 square miles.

I returned by one of the official's automobiles to Elizabethville to catch the weekly plane from Elizabethville to N'dola, 165 miles away, across the border in Northern Rhodesia.

"Copper Belt"

From N'dola, which is the main business district of the so-called "copper belt," I then went directly 45 to 50 miles to Mufulira Copper Company by automobile, all on paved road. Mufulira is where there are eleven 10 foot by 72 inch Hardinge mills.

From Mufulira, I went over to N'kana, then to the operations at N'changa, and following that, to Roan Antelope. These four operations are encompassed in an area of about 50 to 75 miles. Here again the grade of copper produced is much higher than in the United States, running anywhere from 3.0 to 6.0 percent. I

understand that N'changa has potentially the largest copper ore body in the world when the "low grade" reserves, which run about 1.75 percent, are added. There are apparently several billion tons of ore available and still not all prospected by any means. Very little other metal exists in this area. About 150 miles south of N'dola is the Broken Hill operation which is a lead-zinc property.

Next, I took the plane from N'dola to Johannesburg through Stanleyville. Before leaving, however, at the hotel during the evening, native boys came in with wood carvings of animals to sell. I picked up two hardwood pieces, one a carving of an elephant and the other of an antelope, both very well executed. The elephant cost me the equivalent of \$0.40 and the antelope, \$0.35. Duplicate subjects here would cost \$7 to \$10 each.

South Africa

On flying in to Johannesburg, I was intrigued with the tremendous number of tailing piles which were in evidence near Johannesburg, particularly the piles of millions of tons of tailing right in the suburbs of Johannesburg.

The city appeared to be very prosperous. The depreciation of the pound had done the equivalent of increasing the price of gold and this had spurred the mining interests. Also, of chief interest, was the new Orange Free State gold development, the new find of several years ago now just getting under way in production.

The standard of living in Johannesburg is high, but the cost of living is lower than in the United States all things considered, yet some items are very much higher, particularly imported automobiles and nonessentials.

It is my belief that here is a land of progress and opportunity.

PROMINENT MEN IN INTERNATIONAL MINING

R. McLean Stewart has been made a director of the Cerro de Pasco Copper Corporation, which has mines in Peru and general offices at New York, New York. He has been president of the South American Mines Company, Inc., since 1946 and of that company's subsidiaries, Kelowna Exploration Company, Ltd., which has mines in Canada, and South American Development Company, Inc., to name a few.

Dr. Rodgers Peale, American geologist, and two Norwegian geologists are making a study of the 300-year-old Kongsberg Silver Mines at Kongsberg, Norway, in an effort to revive activity in this mine where veins have become exhausted after many years of productivity. Geological and cost surveys are being drawn up for the study.

Jean Nicault, French Equatorial Africa's chief mining engineer, is one of four visiting Frenchmen finishing a study of mine production techniques in the United States. The trip is being sponsored by the Economic Cooperation Administration under its technical assistance program. The other men are **Guy Berthoumieux**, chief mining engineer for French West Africa; **Carlos Windelschmidt**, manager of the Societe des Recherches et d'Exploitations Diamantiferes; and **Pierre Jochyms**, head of the mining department of French Guinea. The men have been studying particularly the uses of mining equipment and methods of ore recovery best suited to the nature of deposits in Africa. On their itinerary was Rifle, Colorado; Silver City, New Mexico; Butte, Montana; the San Francisco area; and southeastern Missouri.

Varley Crompton has been appointed mine manager for Ferguson Mines Ltd. in the Snow Lake area of Northern Manitoba, Canada. He had been in Nicaragua with the American Smelting and Refining Company and before that in Canada with Bralorne Mines.

Dr. Oliver Hall has been elected to the board of Noranda Mines Ltd., Toronto, Ontario, Canada. He was made assistant manager of Noranda in 1931, and then consulting engineer in 1938, and now, besides his new position at Noranda, holds directorships with Hallnor, Pamour, Waite Amulet, Kerr-Addison, and Norancon mines and is president of Gaspe Copper.

R. C. Buckett has left Australia on a visit to South Africa and Southern Rhodesia. He expects to be absent

from Kalgoorlie, West Australia, for four to five months.

G. B. O'Malley, president of the Australian Institute of Mining and Metallurgy, has been appointed honorary lecturer in mining engineering, University of Queensland, for 1951.

Hon. Hector Authier has been nominated to the board of East Rim Nickel Mines Ltd. in Canada. He is a publisher, lawyer and mining executive and has been connected with Canadian Malartic, Lamaque, East Malartic and other Canadian mines in the past.



VINCENTE FERNANDEZ SOLER, mining and metallurgical engineer, is superintendent at the Sociedad Minera y Metalurgica de Penarroya at Penarroya-Pueblonuevo, Cordoba, Spain. From 1920 to 1932 he was manager of several mines in Mexico including Compania Fundidora de Fierro y Acero de Monterrey, S.A. After returning to Spain he became assistant engineer of the Instituto Geologico y Minero de Espana. When the civil war ended he managed several tungsten, kaolin, and tin mines in Galicia. He started working in his present capacity in the beginning of 1950.

John R. Paris, former manager of Christmas Island Phosphate Company Ltd., has joined the Malayan Collieries as senior opencast superintendent. The Malayan Collieries are at Batu Orang, Selangor, Malaya.

Erland Waldenstrom, 39, has been appointed director-general of the AB Grangesberg-Oxelösund and Luossavaara-Kiirunavaara AB companies in Sweden, succeeding **Martin Waldenstrom**.

Edward C. Spalding, a graduate of the Colorado School of Mines, has a position as junior mining engineer and geologist for the Cia. Minera Asarco, S. A., at the Parral Unit, Chihuahua, Mexico.

Arnold H. Miller, consulting engineer of New York, recently returned from a month's professional work in Spain, French Morocco, Italy, France, Western Germany and England.

Robert C. Hills, **Thomas R. Vaughan** and **Richard C. Wells** have been elected vice presidents of Freeport Sulphur Company, which maintains general offices at New York. Hills started with Freeport in 1934 as a chemist in the company's sulphur

operations in Louisiana and later was manager of the metallurgical plant in Cuba of the Nicaro Nickel Company, a subsidiary. In 1946 he became assistant to the president and in early 1950 director of development. **Vaughan** joined the company in 1942, became assistant secretary and later assistant vice president. **Wells** joined Freeport in 1939, became assistant treasurer in 1942 and controller in 1946. He still holds the latter position.

A. E. Schmidt, consulting engineer, has moved from Batu Caves, Selangor, Malaya, to the Chan Wing Building, Kuala Lumpur, Malaya. He advises that practically all new mining work is at a standstill in the country at present.

R. W. Archer has resigned from the staff of the Emperor Gold Mining Company, Vatukoula, Fiji, and is now on the staff of the N.S.W. Mining Company. His postal address is P. O. Box 18, Singleton, New South Wales, Australia.

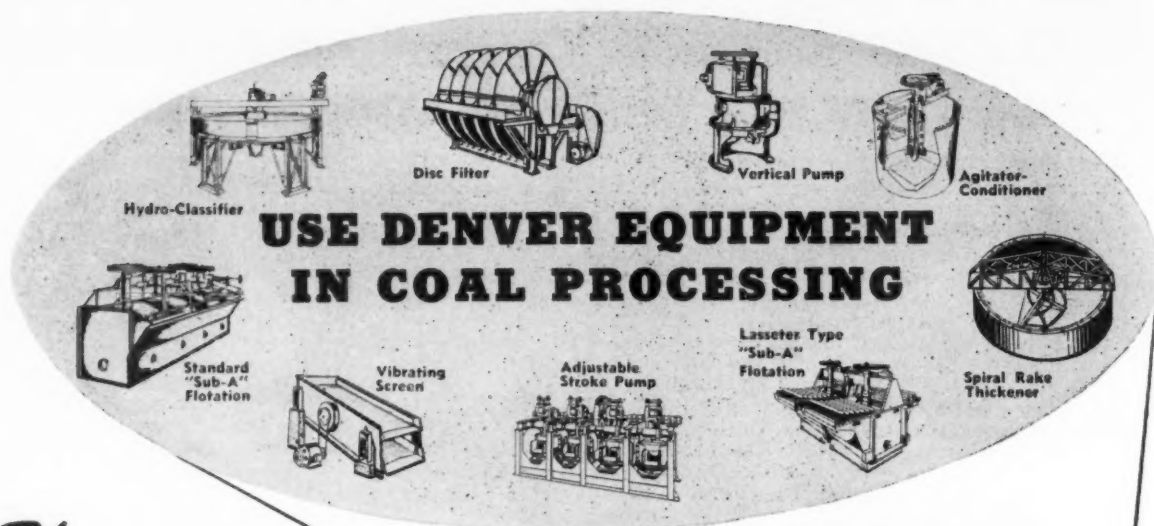
Professor Raymond E. Zimmerman of Pennsylvania State College in the U. S., is in Turkey as consulting engineer with the Koppers Company, Inc., in connection with the Zonguldak Coal Basin mechanization project. Recently he went on a trip to Ergani with a technical adviser of Turkey's Etibank, the government's mine financing and operating company, to inspect the operation of the new flotation mill at the Ergani copper mine.

R. A. Alldred, F.C.I.S., has been appointed secretary of the British Overseas Mining Association, succeeding **W. M. Nolan**, resigned. The Association recently moved to new quarters at 8 Great Winchester Street, London, E. C. 2, England, according to an announcement by **S. S. Taylor**, president.

A. F. Daily, AIME member, has returned to his home at Oakland, California, after an extensive trip to New Zealand, where he studied many of the placer operations in that country.

J. Cramer Roberts, mine superintendent for Associated Mining Companies of Fiji's Loloma Gold Fields property, advises that a branch of the Australian Institute of Mining and Metallurgy has been formed at Vatukoula, Fiji.

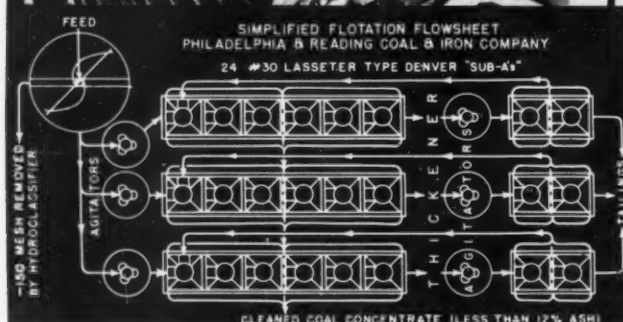
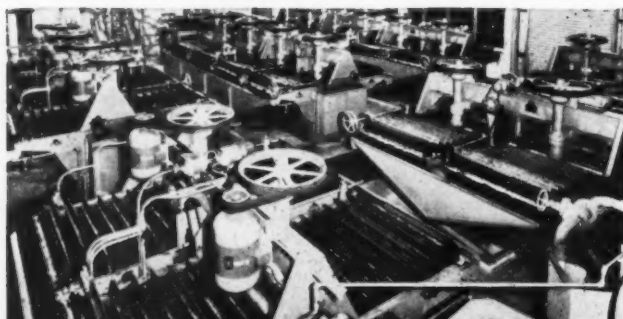
Randolph W. Diamond, vice president and general manager of The Consolidated Mining and Smelting Company of Canada Ltd. at Trail, British Columbia, has been honored by Defense Minister **Hon. Brooke Claxton** who made him an honorary colonel of the 24th Anti-Aircraft Regiment, Reserve Force, Trail.



USE DENVER EQUIPMENT IN COAL PROCESSING

The
**PHILADELPHIA & READING
COAL & IRON CO. Uses**

**DENVER "SUB-A"
(Lasseter Type)
FLOTATION**



...TO RECOVER ANTHRACITE COAL FINES...LOW ASH CONCENTRATE AT LOW COST

Products: Anthracite Coal Fines.

Particle Size: Minus 10 mesh to plus 200 mesh.

Tonnage: 150 TPH initial feed.

Flotation Cells: 24 No. 30 (Lasseter type)
Denver "Sub-A" Cells.

Flotation Feed: Ninety tons per hour
(minus 150 mesh removed from original feed).

Flotation Concentrate: Sixty tons per hour.
(One ton per minute.)

Ash Content: Less than 12 per cent.

Reagent Cost: Less than 15 cents per ton feed.

Hear this Story AT A. I. M. E.

Read this Story IN DECO TREFOIL

This complete story will be told at the February 1951 A.I.M.E. meeting in St. Louis by Mr. H. R. Hagen of the Philadelphia and Reading Coal and Iron Company and will be printed with details and pictures soon in Deco Trefoil.

Reserve your advance free copy now! Write today.



FLOTATION ENGINEERS



"The firm that makes its friends happier, healthier and wealthier"

DENVER • NEW YORK • CHICAGO • EL PASO • VANCOUVER • TORONTO • MEXICO, D.F. • LONDON • JOHANNESBURG

DENVER EQUIPMENT COMPANY, 1404 17th St., Denver 17, Colorado

INTERNATIONAL

S. P. Dandona, who has been with the Champion Reef and Ooregum Gold Mines of the Kolar Gold Field in India since 1928, has been promoted to the position of chief surveyor.

W. M. Billingham, formerly with the Department of Scientific and Industrial Research, Wellington, New Zealand, has arrived in the United States, where he will be a research fellow in metallurgy at the Missouri School of Mines and Metallurgy.

M. F. Goudge now is in charge of the Industrial Minerals Division of the Canadian Mines Branch recently set up to expand research in industrial minerals.

Professor Francis Meunier of the University of Mines, Brussels, Belgium, is in the United States studying methods of extraction of non-ferrous rare metals found in the Belgian Congo. He hopes eventually to encourage the building of refineries in both the Congo and Belgium.

William V. Shakespeare, field engineer for the Independent Pneumatic Tool Company of Aurora, Illinois, has been on an extensive export trip through South America. He visited distributors and customers in Cuba, Haiti, Dominican Republic, Puerto Rico, Venezuela, and Colombia. Other "Thor" men who have made international tours during the 1950 year are **Neil C. Hurley Jr.**, president, who spent some time in Africa and Europe; **W. A. Nugent**, executive vice president; **E. R. Wyler**, vice president and director of exports; **A. N. Nelson**, field engineer, who toured Europe; **J. A. McGuire**, secretary and accessories division manager, and **B. H. Johns**, mining and contractor tool sales manager, who made trips to Mexico.

Marcus Digre, **Thor Amdahl**, and **Klaus Serck-Hanssen** of Norway have been in the United States on an inspection trip to see in action the mines and ore processing plants on the Mesabi iron range of Minnesota. Digre is mill superintendent for the Sydvaranger Iron Ore Company at Kirkenes, Norway. Amdahl is general manager of the Fosdalen Iron Ore Company at Malm. Serck-Hanssen is general manager of the Skorovas Gruber pyrite mines at Trondheim.

B. C. Loubser has been transferred from the New Consort Gold Mines to the Duchon Mine Development Company in Northern Transvaal. He is manager there.

J. H. Penhale was elected president of the Cornish Mining Development Association at the recent annual meeting at Truro, England. **John Trousoun** was elected executive chairman and **F. B. Michell** (one of MINING WORLD's correspondents) vice-chairman. The Association is urging the British government to establish an

organization like the United States Bureau of Mines, to be called the Mineral Development Commission, and to help metal mining in Great Britain.

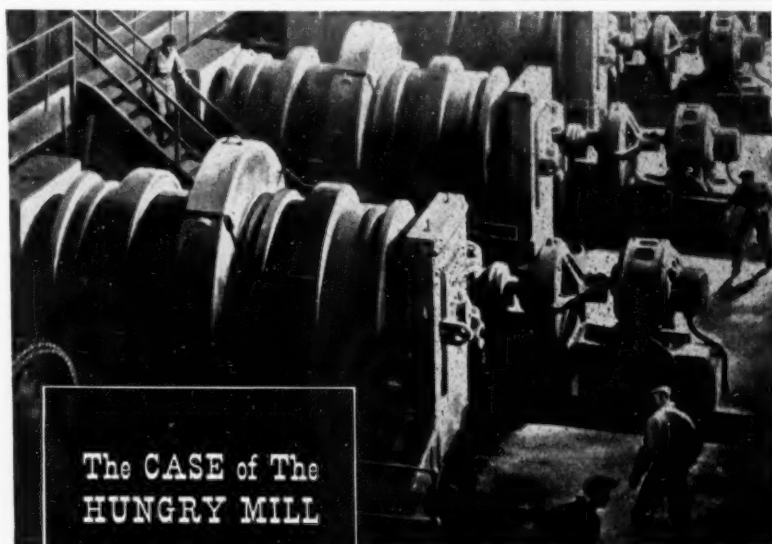
Dr. D. W. Phillips, professor of mining engineering at the University of Technology, Sydney, has been appointed Australian member of the council of the Institution of Mining Engineers, London.

Henry Hill, formerly engineer in charge of the Reeves-Macdonald Mines, Canadian subsidiary of Pend Oreille Mines and Metals Company, is carrying out a diamond drilling program on Quatsino Sound, northwest Vancouver Island, British Columbia, to find the projected ex-

tension of the copper ore belt being developed by Coast Copper Company.

Harold Lakes, well known in mining engineering circles in interior British Columbia for the past quarter century, has been appointed general manager of Canadian Exploration Company's base metal and tungsten operation at the Emerald Mines near Salmo, succeeding **R. E. Legg** of Vancouver, B. C.

F. T. C. Doughty is leaving Cyanamid Products Ltd. to become managing director of a new company called Mineral Recovery Ltd. at 17 Victoria Street, London S. W. 1, England. The company has been formed to develop mineral dressing techniques in England and Europe.



The CASE of The HUNGRY MILL

Two grinding mills running side by side . . . one accepting only moderate amounts of ore but always overfull, never turning out the tonnage expected of it. The second mill, grinding ravenously, always delivering well over its capacity rating. The size was the same, construction made the difference.

Conventional trunnion overflow mills run nearly half full at normal speeds, with a balanced load condition which uses only part of the power made available by the driving motor. MARCY Low Pulp Line mills have a higher rate of discharge, use a

much thicker pulp. Grinding medium, coated with thick pulp, delivers a full impact drop with faster reduction. The load in a MARCY is never balanced, always uses the full torque of the driving motor.

In the case quoted here, the second mill, a MARCY, paid off in 29.6% faster grinding and proportionately lower costs per square foot of floor space. This is a true story taken from records of operating milling plants. Ask us to give you complete facts on MARCY grinding under your conditions. Our engineers can show you how MARCY mills will save you money in many ways. Write for our free engineering services.

OTHER PRODUCTS

Mosco Fahrenwald Flotation Machines; Mosco-McCarthy Hot Millers; Rock Bit Grinders, Density Controllers; Belt Feeders; Pinch Valves; Assay and Laboratory Supplies and Equipment; Complete Milling Plants.



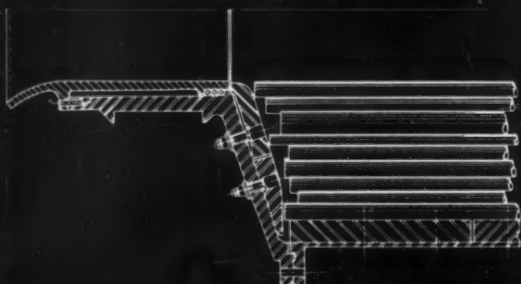
Main Office: DENVER, COLORADO, U.S.A.; El Paso: Salt Lake City: 1775 Broadway, New York, N. Y.; Canadian Vickers, Ltd., Montreal; W. R. Judson, Santiago and Lima; The Edward J. Hall Co., Seattle, P. I.; The Ore & Chemical Corp., 80 Broad St., New York 4, N. Y., Representatives for Continental Europe.

THE **Mine & Smelter**
SUPPLY COMPANY

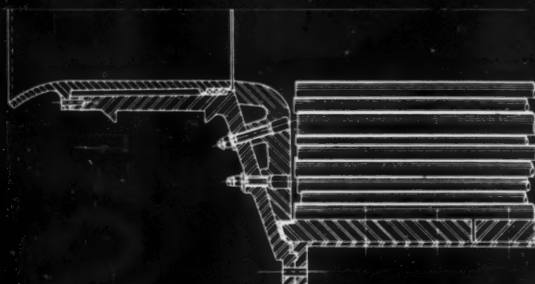
Allis-Chalmers Builds Rod Mills with Straight ^{INSTEAD OF SLOPING} End Liners

HERE'S WHY...

- Less Rod Overlap
- Less Wasted Grinding Area
- Less Gouging of End Liners by Protruding Rod Ends
- Better Grinding Efficiency ... Less hp per ton
- Minimum Tramp Oversize in Product



Sloping end liners invite this condition. Rods overlap, causing wasted grinding area at rod ends and excessive wear on end liners.



Vertical end liners keep rods even in mill. Wear on end liner is greatly reduced. All of rod length is utilized for useful grinding.

STRAIGHT END LINERS mean better grinding performance all around . . . with less costly maintenance. That's why vertical end liners are standard on Allis-Chalmers rod mills.

It adds up to this—close control of product top size . . . and less hp required to grind more product. All available rod length is utilized. No wasted power caused by rod overlap. The actual gain in grinding efficiency with vertical end liners may be as high as 2 percent!

Allis-Chalmers is the *only manufacturer* building large rod mills with vertical end liners. Other reasons why it pays to specify Allis-Chalmers for grinding mills:

- ▶ There's no pocket between end liner and head at trunnion end to fill with pulp and form a race. This space is filled with cement before end liner is installed.

- ▶ Three packing rings seal space between trunnion liner and trunnion.

- ▶ Trunnion bearings on larger size mills are equipped with an individual high pressure lubricating pump to "float" the mill for starting. No destructive bearing wear caused by high starting torque.

There is an Allis-Chalmers engineer-consultant in your area who can point out other advantages of A-C grinding mills . . . and help you work out your grinding problems. Call him, or write Allis-Chalmers, Milwaukee 1, Wis.

Allis-Chalmers builds overflow, center and end peripheral discharge rod mills; ball, pebble and preliminator mills; multi-compartment Compeb and Ballpeb mills.

Compeb and Ballpeb are Allis-Chalmers trademarks.

ALLIS-CHALMERS

A-3241

Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.



Motors



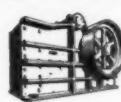
Controls



Texrope Drives



Vibrating Screens



Jaw Crushers



Kilns, Coolers, Dryers



INTERNATIONAL NEWS

Iron Ore Company Begins \$200,000,000 Project

George M. Humphrey, president of The M. A. Hanna Company and of the Iron Ore Company of Canada, has announced arrangements for financing the development of the Labrador-Quebec iron ore deposits in the total amount of \$200,000,000.

This is probably the largest initial development in a mining venture that has ever been undertaken. The plans call for completion of construction of mining, railroad and handling facilities, and the start of ore shipments in 1955. Shipments will reach 10,000,000 tons a year shortly thereafter. The drilling program has developed more tonnage this season and the total drilled and proven ore now exceeds 400,000,000 tons of high-grade openpit ore with prospects for large additional tonnages.

The Iron Ore Company of Canada has retained the engineering firms of Stone & Webster, Coverdale & Colpitts, and Sanderson & Porter, who have been working over the past several months on the plans for the 360-mile railroad from the ore deposits to the port of Seven Islands on the St. Lawrence River, as well as on plans for the necessary equipment, townsites, power plants, and terminal handling and loading facilities. The services of the Canadian firms of C. D. Howe Company, Ltd., and Montreal Engineering Company, Ltd., have been retained in connection with the designing of the terminal handling facilities and the hydro-electric developments.

Contracts for building the railroad are held by a group of contractors including Cartier Construction Co., Ltd., of Montreal; Fred Mannix & Co., Limited, of Calgary; McNamara Construction Co., Ltd., of Toronto; and Morrison-Knudsen Company of Boise, Idaho. The equipment is being moved in and construction has begun.

Norway Forms Company to Mine Niobium Deposits

Niobium mining will be started very soon by the new company, A/S Norsk Bergverk, formed by the Norwegian Government and jointly owned by it and by the Norsk Hydro, the country's biggest chemical manufacturing firm. The new company is capitalized at £100,000.

The niobium deposits to be worked are at Holla near Ulefoss in the central district of Telemark and contain

an estimated 6,000,000 tons of ore, as far as is known from preliminary investigations.

Norsk Bergverk hopes to mine 60,000 tons during 1951 with a yield of 2,400 to 4,000 tons of manganite MnO [o n] concentrate, 3,000 to 4,500 tons of apatite concentrate and up to 150 tons of niobium concentrate. (Apatite, used in the manufacture of phosphorous fertilizers, has been imported up to now by Norway.) The company also will explore other deposits in the Dunderland Valley and at Grong, northern Norway.

Mining Firms Continue to Move From Britain

Sir Ernest Oppenheimer's £110,000,000 copper empire, Anglo-American Corporation of South Africa, Ltd. (which includes Rhokana Corporation, Ltd., Nchanga Consolidated Copper Mines, Ltd., Rhodesian Anglo American, Ltd., and Rhodesia Copper Refineries, Ltd.), will move its headquarters to Rhodesia, according to official announcement. The reason is to avoid British profits and income tax. The group will save about £1,500,000 a year by the latest figuring, which does not take into account the enormous expansion program of Nchanga or the working at full scale of the Refinery.

Other companies with control or activities overseas are discussing the desirability of moving, but British shareholders and directors are not keen on companies leaving control of British law. However, American and Swiss interests, who are putting up a great deal of the new finance required for African mining, insist that companies in which they invest are moved away from British taxation—but unless companies need new money from abroad their headquarters probably will remain in London.

How moving affects a company's position can be seen from the results of Messina (Transvaal) Development Company Ltd.'s transfer to South Africa last January. For the eight months since incorporation in South Africa in February, the company reports a total profit of £848,000 and is paying a dividend of 160 percent (8/- a5/- stock unit), which exceeds the most optimistic expectations. Of this profit, only £86,000, or 22 percent of the total profit, has been paid in South African taxation. For the year to June 30, 1949, when the company was subject to British taxation, 53 percent of the total profit was paid in taxes. Profits of this company

under the present copper boom seem to be running at the rate of about 500 percent per annum.

Intense Prospecting Under Way in Northern Finland

Finland's intensification of mineral prospecting and exploration in the northern part of the country has resulted in about 200 samples being received at the Government's new Geological Office for Prospecting at Oulu, the economic center of northern Finland. Systematic prospecting is planned in the most promising regions, and the new Finnish magnetometer is expected to be of great assistance in this work.

Figures concerning concessions granted and mining districts formed during the first half of 1950 are not yet available. In 1949, 72 claims for concessions were filed at the Ministry of Trade and Industry, and 15 claims received interlocutory judgment in 1948. The Ministry granted 86 concessions certificates in 1949, and 9 claims were refused and interlocutory judgment was given in 33 cases. Six new mining districts were formed in 1949, and the total number of legal concessions was 188 in 57 areas, and 189 mining districts in 37 localities.

Lebanon, Syria and Arabia Buy Mexican Silver

Lebanon will join Syria and Saudi-Arabia in buying large quantities of Mexican silver for coins, according to Dr. Felipe Takla, chief of Lebanon's delegation to the United Nations.

Lebanon will buy several million dollars worth of silver either in pure form or as minted coins. Syria and Saudi-Arabia have purchased several million dollars worth and not long ago the Chinese Nationalists and Germany also bought a substantial amount. Mexican government officials say that coins are being turned out by the mint at a rate of 600,000 to 700,000 daily.

Meanwhile Mexico has stopped silver shipments to the United States for fear the United States will freeze the price of 72 cents an ounce. Mexico hopes to bring about a "necessary" increase in the price before it becomes stabilized at too low a level to mine. As the large purchases by the above countries will leave Mexican reserves low, as possible silver "dumping" by other countries such as Spain may lead to quick purchase and further reduction of world "surplus," and as

a new and proven tool in metallic and non-metallic minerals and chemical processing



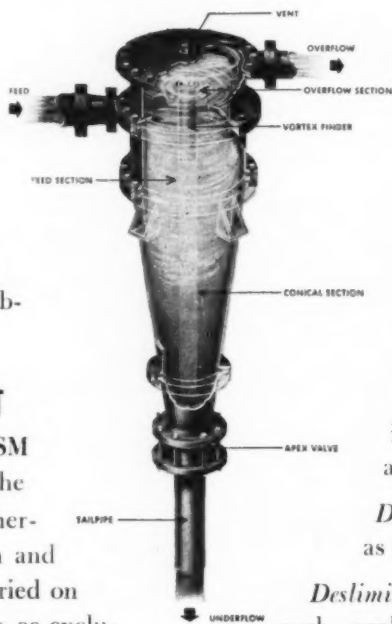
The DorrClone is a compact cylindrical-conical classification unit utilizing centrifugal force in place of gravity. It provides a new method of separating finely divided solids in liquid suspensions and constitutes an important new tool with which to supplement current established practices.

RESEARCH AND DEVELOPMENT

Development of the DorrClone (DSM Cyclone) was begun in 1939 by the Dutch State Mines in The Netherlands, where a continuing research and development program has been carried on since that time. The Dorr Company, as exclusive licensee under the Dutch State Mines patent rights in all fields other than that of heavy media separation, has been actively engaged since 1948 in development work relating to design variables affecting performance, materials of construction and possible fields of commercial use. The result of this program is a carefully engineered unit, capable of controlled and predictable operation.

Further information... We welcome inquiries on specific problems and applications and are prepared to undertake engineering investigations within the scope of our present knowledge and experience.

*DorrClone is a Trademark of The Dorr Company



PRESENT AVAILABILITY

DorrClones are now available singly or in multiple arrangements in four standard sizes: 3", 6", 12" and 24" diameters.

APPLICATIONS

Standard units are now limited to separations in the 20 micron to 100 mesh range but present studies indicate broader applications in the future. Typical commercial applications proven to date are:

Degritting of viscous suspensions such as milk of lime and clay slurries.

Desliming of metallurgical pulps, phosphate rock, coal, iron ore and tailings for mine backfill, with the production of extremely dense underflows where such are desired.

Classification of crystalline and other granular suspensions.

PATENTS

The DorrClone is covered by patents issued and pending in the United States and other countries.



THE DORR COMPANY, ENGINEERS
BARRY PLACE, STAMFORD, CONN.

NEW YORK • ATLANTA • TORONTO
CHICAGO • DENVER • LOS ANGELES
RESEARCH AND TESTING LABORATORIES
WESTPORT, CONN.

SUGAR PROCESSING

PETREE & DORR DIVISION, STAMFORD, CONN.

ASSOCIATES AND REPRESENTATIVES

Dorr Technical Services and Equipment Are Also Available Through Associated Companies and Representatives in the Principal Cities of the World. Names and Addresses on Request.

DORR
RESEARCH — ENGINEERING — EQUIPMENT

an enormous increased demand for silver has become evident, future mining of silver by Mexico should be very active and must be at a higher price level.

Development of Canadian Asbestos Claims Grows

Asbestos mining in British Columbia is showing increased activity at present. A new company, Pacific Asbestos Corporation Ltd. has been formed to develop a deposit at Sproat Mountain, near Revelstoke, British Columbia. Under the direction of Dr. Victor Dolmage, consulting geologist, exploration revealed both slip and cross fibre types of asbestos in surface deposits. An initial \$50,000, and an eventual \$600,000 more, is being furnished by a private group to get the mine into production by September, 1951. Road building has been completed and a diamond drilling contract awarded. The deposits lie in a peridotite mass about 2,600 feet long and 1,000 feet wide.

Another potential mine is that of the Conwest Exploration Company which has discovered a surface deposit in northern British Columbia near the Yukon border, according to Dr. William V. Smitheringale, company geologist. A large tonnage of asbestos, in serpentine, has been broken by frost action and lies—in nearly shipping condition—in talus. Conwest has 15 claims, called the Rugged Group, and if transportation problems can be overcome (to get to the property now requires a 17-mile horseback ride), the company will start development.



LATIN AMERICA

MEXICO—The American Smelting and Refining Company's Avalos unit in the State of Chihuahua will construct a plant for the treatment of zinc slag at a cost of \$8,092,485, according to reports. Officials of the company recently visited the United States to buy equipment for the installation.

VENEZUELA—Iron ore shipments are beginning from the El Pao mines of the Iron Mines Company of Venezuela, subsidiary of the Bethlehem Steel Company. The company recently completed a railroad from the mines to Palua on the Orinoco River from which ore will travel on barges to Puerto Hierro and from there to the United States in ore ships. About 2,000,000 tons of ore will be exported annually.

ARGENTINA—Prospecting, exploration and development have increased considerably and have resulted in the discovery of several good prospective mines throughout the provinces of Argentina. At Quebrada de la Cebila, La Rioja Province, exploration and development of antimony deposits have disclosed mineralized widths up to one meter and individual samples assaying up to 55 percent Sb₂S₃. In Catamarca Province, investigations are being made of the La Meseda asbestos deposits and the Santo Domingo mica occurrences. In Rio Negro Province, iron deposits at Sierra Grande are being explored and one vein has been found measuring 15 meters wide. In Tierra del Fuego Province, examination of placer deposits continues, and exploration of the Fontana Lago lead and zinc deposits is being conducted. In Santa Cruz Province the Punta Virgenes gold-bearing gravels are being examined.

MEXICO—Since Guanajuato state authorities expect an increase in silver mining because of the rise in world prices, they have requested that the Mexican Bureau of Mines dismantle an abandoned mill in the Santo Nino district and move it either to Mexiamora, San Pedro Gilmonene, or La Luz.

BRAZIL—Jose Ermirio de Morais, Sao Paulo engineer and industrialist, heads an organization of Brazilian

capitalists which will build an aluminum mill 45 miles from Sao Paulo. Bauxite for the mill will be brought in from the mines at Pocos de Caldas, 150 miles away. The new mill will help meet demands from the state aluminum industries which have had to import ingots from abroad.

COLOMBIA—By the end of September *Nechi Consolidated Dredging Ltd.* had dredged 4,126,000 cubic yards of gold-bearing gravel during 388 possible working days since its installation. Fine ounces of gold recovered amounted to \$23,693.75. Total value was \$829,281.25 at \$35.00 per ounce.

MEXICO—The Mazapil Copper Company, Concepcion del Oro, Zacatecas, has been progressing with its development program which included the construction of a lead smelter and sintering furnaces, now nearing completion, and some changes in treatment processes. The company recently announced that it also contemplates the eventual reconditioning of its power plant.

MEXICO—A new trade pact concluded with Italy calls for Mexico supplying the latter with copper, lead, silver, and manganese in large amounts. Italy will send industrial equipment, machinery, automobiles, and machine tools. Such foreign orders are expected to result in increased Mexican mining activity during the next year.



EL MARMOL—A MAJOR SOURCE OF ONYX

Located 310 miles south of the United States border off California, in the waterless, sun-baked, Viscaio desert of Lower California is the little village of El Marmol—"The Marble." It has a population of about 200 Mexicans and two Americans. All water must be hauled by truck from a well 15 miles away. But at El Marmol 70 percent of the United States' supply of onyx is quarried by the Southwest Onyx Company. Under the direction of Kenneth Brown, superintendent, the onyx is removed from the earth with hand tools and old machinery just as was done at the turn of the century when the mine began operating. First pneumatic drills and gigantic crowbars are used to loosen the solid blocks from the desert ground. Then a wooden derrick lifts them from the pit and swings them to a stockpile where men chip the blocks down with sledges and chisels into ten-ton squares. Finally, two blocks at a time are hauled by truck over the torturous mountain roads to San Diego, California, where the onyx is carved into jewelry and sheets for office walls and floors. In the picture above one of the stockpiles is shown with its onyx blocks chipped to size and ready for shipment. Note the small hand tools being used for chipping and removing onyx from the pit.

**now
TWO MORE**

Completely New

HD-9

WEIGHT: 18,500 lb.
70 DRAWBAR Hp.
GM 4-71 DIESEL ENGINE
SPEEDS: 6 forward, to 5.68 mph.;
3 reverse, to 4.43



OUT AHEAD

**Modern Allis-Chalmers Line
sets New Tractor Standards**



HD-5



HD-9



HD-15



HD-20

Each of these four Allis-Chalmers crawlers gives you a new yardstick for rating tractors. Each brings you a new kind of performance . . . plus new strength, operator comfort and service simplicity. For the finest in crawler tractors, see your Allis-Chalmers dealer.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

The World's Most Modern Line of Crawler Tractors

Allis-Chalmers Tractors

NEW POWER RATING

POWER, WEIGHT, BALANCE put them in a class of their own — never such traction... such pulling, pushing or lifting ability. And the smooth-operating GM 2-Cycle Diesel engines work without strain under the most extreme conditions.

NEW STRENGTH

All parts are designed and built to carry their loads with a margin of safety. No need to go to a larger tractor just for strength alone. The HD-9 and HD-15 set new standards for tractor quality.

- ✓ For Greater Production
- ✓ For Easier Operation
- ✓ For Simplified Servicing

NEW DESIGN SIMPLICITY...

for Easier Control and Greater Operator Comfort — Easy-shift transmission • Self-energizing brakes • Booster steering controls • Adjustable, cushioned seat • Wide arm rests • Convenient controls and pedals • Full visibility • Instant electric starting.

for Simplified Servicing — Unit construction permits removing major assemblies without disturbing companion groups • Extended lubrication periods throughout — 1,000 hours on truck wheels, idlers and support rollers.

Complete Line of Matched Equipment,
Developed in Cooperation With
Allied Manufacturers, Available For Both The HD-9 and HD-15.

HD-15

WEIGHT: 27,500 lb.
102 DRAWBAR Hp.
GM 6-71 DIESEL ENGINE
SPEEDS: 6 forward, to 5.80 mph.;
3 reverse, to 4.51



TIMKEN® alone offers all 3 rock bit types



and a complete Rock Bit Engineering Service!

HAVING rock bit troubles? If you think your unit bit cost or cost per foot of hole is too high—or drilling is too slow—get the help of the Timken Rock Bit Engineering Service *now*. Only Timken® rock bit engineers have *all three* types of bits to choose from:

- 1** **MULTI-USE**—gives lowest cost per foot of hole when full increment of drill steel can be drilled and when control and reconditioning of bits are correct.
- 2** **CARBIDE INSERT**—for extremely hard and abrasive ground. Drillers spend less time changing bits.
- 3** **ONE-USE "SPIRALOCK"**—for use where reconditioning is impractical or undesirable. Lowest unit cost. Has revolutionary new "Spiralock" union.

Timken rock bit engineers are the world's largest

field organization devoted exclusively to rock bit problems. They've been helping to solve those problems for more than 17 years and their research leads the field.

FREE BOOKLET! Illustrations and detailed descriptions of the full line of bits. Information on engineering service. Write to The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".



TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

**... your best bet for the best bit
... for every job**

INTERNATIONAL



EUROPE

SWEDEN—The *Hoganas-Billesholms AB Company*, which has carried out extensive metallurgical research for the past five years at an old mine on the island of Ulvo, near Ornskoldsvik, has decided to start mining because of the promising results of the research. Besides iron the Ulvo ore contains vanadium and titanium, giving further impetus to the decision to begin operations.

AUSTRIA—The *Austrian-American Magnesite Company* at Radenthein has been shipped a prefabricated heavy media separation plant from Western Machinery Company, San Francisco, California. Incorporating a 14-foot diameter Wemco Cone Separator as the separatory vessel, the new plant will treat 40 metric tons per hour of 1 inch by 10 mesh magnesite ores. Installation and operation of the Mobil-Mill will begin as soon as possible under supervision of a technical representative from Wemco. The order was placed through the Austrian offices of The Ore & Chemical Corporation of New York City.

PORTUGAL—Newly discovered tin deposits on *Beralt Tin and Wolfram Ltd.*'s property at Panasqueira, Biera Baixa, may be workable at much lower cost than other deposits in the mine, according to F. Gates, chairman. Investigations are under way to determine the extent of the deposits and if they are large enough and mining can be undertaken, the company's mill will be re-equipped for treatment of these ores.

FRANCE—Extraction of several important metals has shown encouraging increases during 1950. A monthly average of 68,200 tons of bauxite has been mined, a seven percent increase over 1949. Lead production has averaged 1,455 tons monthly, a 14 percent increase, and zinc has averaged 2,100 tons monthly, a 13 percent increase.

AUSTRIA—The prospective project to install an electric reduction furnace at the property of *Oesterreichische Alpine Montangesellschaft*, a nationalized company, reportedly will make Austria self-sufficient in ferro-manganese and capable of exporting a small surplus. Austria has no workable manganese mines, and the only domestic sources are the 3.0 to 3.5 percent manganese content of the iron ore (siderite) found at Huttenberg, Carinthia; the 1.5 to 2.0 percent manganese content of that mined at Eisenerz, Styria; and

the 1.6 to 2.0 percent manganese content of Austrian iron ore.

YUGOSLAVIA—Four asbestos deposits have been reported found in Central Serbia, all of them containing long-fibered asbestos, similar to that mined in Canada. One deposit was traced over a length of 10 kilometers.

FRANCE—In the first six months of the year potash production from the *Mines de Potasses d'Alsace* reached 3,913,000 tons, and production is said to be a year ahead of expectations.

IRELAND—An American zinc manufacturing concern is said to be interested in the development of the lead mines at Abbeytown, Ballysodare, County Sligo, Eire. Under the recent U. S.-Irish agreement, however, any project must be financed by at least 51 percent of Irish capital. During the past 150 years, several attempts have been made to work the mines, the present operation commencing about a year ago when the *Abbeytown Mining Company*, under the direction of Maxwell Guinness and Alex Reid, was formed. The company plans to increase its activities by developing the mine at the same time that the old dumps are being treated. At present about 30 men are employed and additional employees probably will be hired as the program gets under way.

ENGLAND—Drilling has established the existence of at least 200,000,000 tons of potassium chloride in a 12-mile area in East Yorkshire, or enough to satisfy England's demands for 140 years. Britain has been spending about £6,000,000 annually for potash imports.

AUSTRIA—The *Bleiberg Bergwerksunion* has started operating an antimony dressing plant at its *Rabant* mine. Annual output will be 4,000,000 schillings worth of antimony, of which about one-third will be exported.

ITALY—The expansion program of the *Finsider* company (*Societa Finanziaria Siderurgica P. A.*) at Cornigliano will be assisted by an additional \$2,165,000 from the Economic Cooperation Administration, bringing to \$26,223,000 the total ECA money supplied to the company. Steel mill equipment for three *Finsider* plants is being bought.

ENGLAND—At Luckett, near Callington, *New Consols* mine has been unwatered to the 86 fathom level and the shaft equipped for hoisting to the surface. Existing stage pumping is being replaced by duplicate centrifugal pumps of 1,000 gpm capacity at the 64 fathom level to pump directly to the adit level. Installation of centrifugal pumps is planned at the 96 fathom level as soon as it is unwatered. With the water

WORLD MINING

Issued as an International
Department of
MINING WORLD

by American Trade Journals,
121 Second St., San Francisco,
California

A Miller Freeman Publication

Publisher . . . W. B. FREEMAN
General Manager . . . M. F. HOISINGER
Editor . . . G. O. ARGALL, JR., E. M.
Production Manager . . . J. M. STALUN
Eastern Manager . . . K. WEGKAMP
Field Editor . . . HOWARD WALDRON
News Bureau . . . V. P. COLLINS

Regular correspondents in the following cities and mining centers:

Stockholm, Cyprus, San Jose (Costa Rica), London, Tokyo, Frankfurt, Vancouver, Paris, Mexico City, Helsinki, Redruth (Cornwall), Oslo, Benares (India), Dersley (Transvaal, South Africa), Singapore, Madrid, Ankara, Lima, Rome, Sao Paulo, The Hague, Johannesburg (South Africa), Trondheim (Norway), Port Kembla (N. S. W., Australia), Costermansville (Belgian Congo), Accra (Gold Coast).

WORLD MINING is published the 26th of each month as a regular department of MINING WORLD and is also circulated as a separate section on a carefully controlled free basis to a selected list of management and supervisory personnel associated with active mining enterprises throughout the world.

FOR SALE

To substantial mining company. Five manganese properties, Grade 40%, in virgin country. Now producing more than one car daily. Legal owner: Jose M. Camarillo, Av. Abasco Num. 515 Pte., Torreon, Coah., Mexico.

WAREHOUSE CHIEF

45 years; 10 years' experience supervising mine warehouses; perfect knowledge of all phases: ordering, cost calculation, distribution, etc. Fluent knowledge Spanish; at present employed. Desired position South America. Reply Box A-3, MINING WORLD, 121 Second St., San Francisco 5, Calif.

WORLDWIDE PROFESSIONAL DIRECTORY

Alexander R. Kingard

Mining engineer

TUNGSTEN — MANGANESE — URANIUM

Domestic & foreign investigations

Suite 9—672 So. La Fayette

Park Place

Los Angeles, Calif.

H. F. McFARLAND, Engineer

MINING AND GEOPHYSICAL

EXAMINATIONS

2001 South Marion St., Denver 10, Colorado

ROGER V. PIERCE

Mining Engineer Specialist

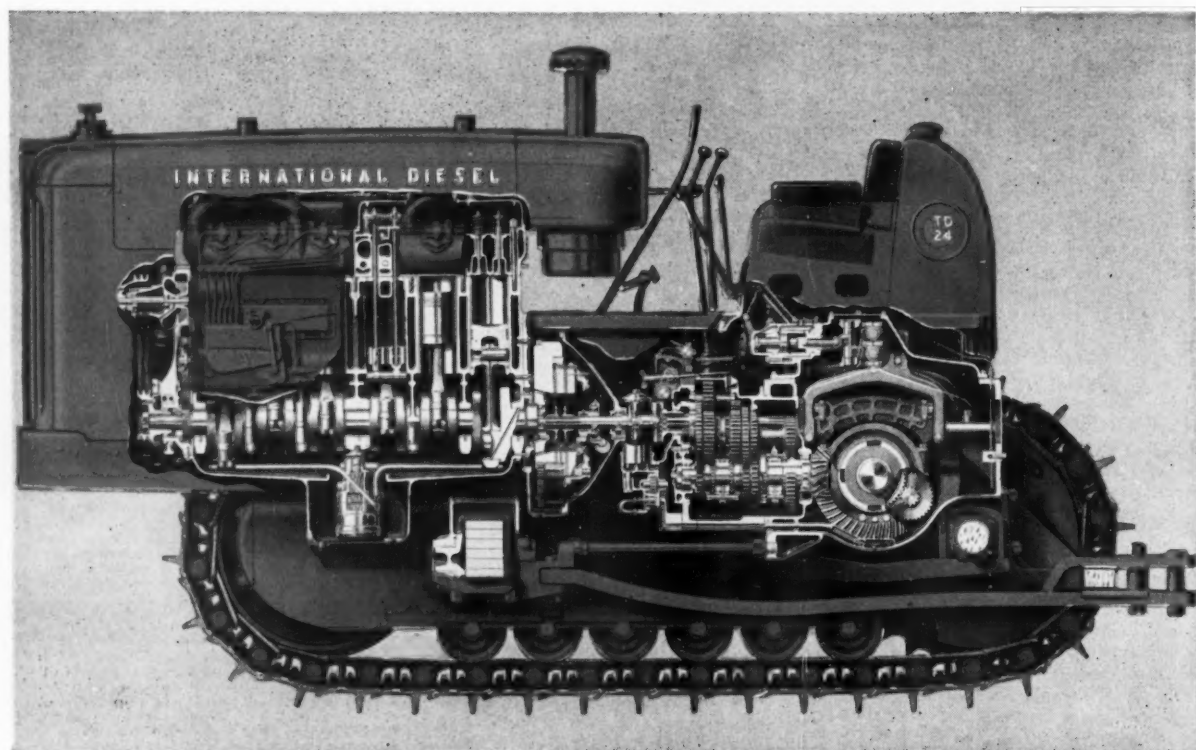
Underground Mining Methods, Cost Cutting Surveys—Production Analysis—Mine Mechanization—Mine Management
808 Newhouse Bldg. Phone 33973
Salt Lake City 4, Utah

MARVIN J. UDY

Inorganic Chemistry Electrochemistry
Electric Furnace Smelting
Process Metallurgy

Ferro-Alloys, Calcium Carbide, Phosphorus
546 Portage Road Telephone 2-6294
NIAGARA FALLS, N. Y.

GUTS OF A CHAMP



Inside story of the TD-24

When two-legged people have guts, they finish the fight and do the job.

Real guts—that's what the world admires—man or machine.

You can't define what makes guts in a man, but you can "analyze" the fighting, working, dogged innards of the Champ. So let's put the X-ray on the TD-24:

Drawbar Horsepower: 148 working horsepower delivered at the drawbar in official tests.

Synchromesh Transmission: you "shift on-the-go," with eight speeds forward, eight reverse for faster time cycles.

Instant Speed Change: up or down one speed without declutching.

Planet Power Steering: all turns are easier... pivot turns, feathered turns, turns with power on both tracks.

Reserve Torque: gives the Champ the lugging ability to fight through temporary overloads.

Easy Steering: finger-tip hydraulic controls.

All-Weather Starting: push-button, gasoline-conversion starting—an International exclusive—gets you on the job fast.

More Work: the TD-24 is doing more work—with more speed and more lugging ability—than any other crawler tractor on the market.

Look it over. Then ask your International Industrial Distributor to show you what it can do for you. You'll be a TD-24 man from then on in.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

INTERNATIONAL



POWER THAT PAYS

INTERNATIONAL

situation secure, the existing shaft will be sunk 30 fathoms deeper and the main lode explored at depth. In the mill, the present stamp battery is being replaced by a Hardinge mill and additions made to bring the output to 200 tons daily.

FINLAND—One of the largest magnesite deposits found in Europe so far has been reported located at Kaaritunturi in the Finnish Lapland on the border line between the communities of Enontekiö and Inari. The deposit is said to contain millions of tons with a high percentage of magnesite.

ENGLAND—In northern England, the *Anglo-Austral Mining Company's* plant at Nenthead, Cumberland, now is producing acid grade fluorspar from old dumps. Alan C. Harrison is in charge of the concentrator. A few miles over in Wear-dale, *Fluorspar Ltd.* continues to operate its fluorspar mine. William Hutchin has left and W. Herdman has been appointed general manager. In the Leadhills district of Lanarkshire rumors have been heard that some attempt may be made to reopen the lead mines. Until about 20 years ago, when the depression forced all workings to close, lead mines had been operating there since the thirteenth century. At the time of their closure, the price of lead was only £20 per ton compared with £128 at present.

ENGLAND—Reports of activity in Cornwall say that a small wolframite property is being developed near Liskeard and that an abandoned open-pit mining property in the Bodmin district has changed hands and may be reopened.



INDIA—A new company, *The Hyderabad Gold Mines Company Ltd.*, capitalized at Rs.10,000,000, has been established for prospecting and mining gold and precious stones in Hyderabad State. The company took over the property and assets of the *Hyderabad Gold Development* company from the state government and is at present mining at Hutti, Raichur district. A pilot plant has been erected, and crushing, grinding and cyanidation have begun on a small scale—the mill can treat 150 tons daily. Messrs. John Taylor & Sons, London, are managers and consulting engineers for a period of ten years.

TURKEY—According to reports, private operators have started working the chrome deposits near Bahcecik and Nuzhetiye in the province

of Izmit. Also reported is the discovery of a large body of manganese in the Kure-Yenisar region of European Turkey. The deposit will be worked this spring.

MALAYA—The latest reports from the *Tronoh* mines give an idea of how well Malayan tin companies are doing with the price of the commodity at its present fantastic levels. The company's largest dredge, the No. 1, reached virgin ground December, 1949. In the first nine months of 1950 output increased to 1,627¼ tons from 901 tons in 1949. Total Malayan production of tin concentrates in the first 10 months of 1950 was 48,143 tons. The government is about to sponsor a survey of undeveloped tin areas in order to extend reserves now estimated as sufficient for only 11 more years at present production rates. An adverse note in Malayan tin production concerns the individual companies which fear the possibility of doubled income tax to 40 percent.

INDIA—India's bauxite reserves are extensive and are estimated (of all grades) at 250,000,000 tons, of which 35,000,000 tons are said to be of high grade. Although Indian bauxite is now receiving greater at-

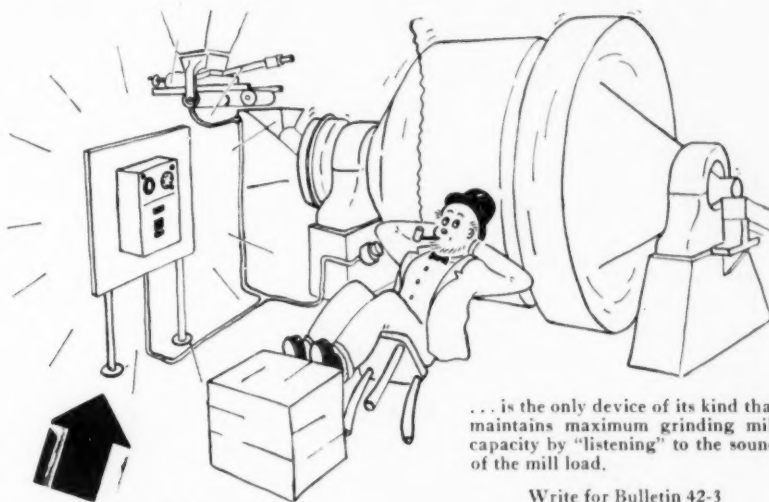
tention than previously, one important characteristic of Indian bauxite is its high titanium content which contributes to higher costs in its purification process. Investigations on the possibility of introducing beneficiation of high-titanium bauxite through chlorination are being carried on and if they yield substantial results the removal of the titanium content will be possible without much loss of alumina.

CHINA—The repair work at the *Pong-chia-pu* mine of the *National Long-yen Iron Mines* has been nearly completed and some production has begun.

PAKISTAN—Following recommendations of several United States experts, a steel mill will be established in Pakistan. The facilities will consist of finishing mills to produce hot-rolled sheets, wire and bar products. Pakistan's annual steel consumption during the next two years will be about 260,000 tons, but in 10 years annual consumption probably will rise to 600,000 tons. The mill will be one assurance that this need is met.

INDIA—Enough limestone to feed a factory producing 700 tons of cement daily for 65 years is reported

The Hardinge "ELECTRIC EAR"*



*Reg. U. S. Pat. Off.

... is the only device of its kind that maintains maximum grinding mill capacity by "listening" to the sound of the mill load.

Write for Bulletin 42-3

HARDINGE
COMPANY, INCORPORATED

YORK, PENNSYLVANIA—240 Arch St. Main Office and Works

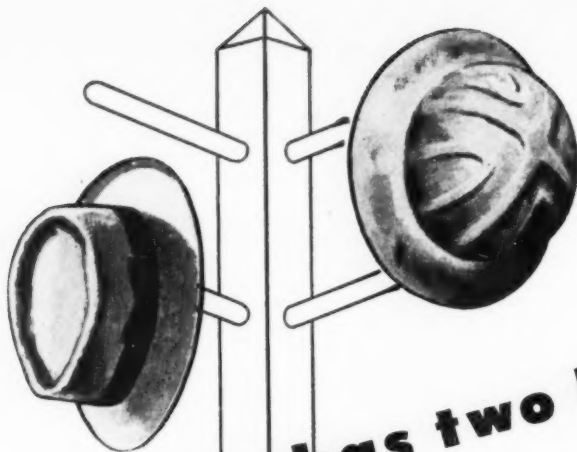
NEW YORK 17 • SAN FRANCISCO 11 • CHICAGO 5 • HIBBING, MINN. • TORONTO 1
122 E. 42nd St. 24 California St. 205 W. Wacker Dr. 2016 First Ave. 200 Bay St.

[World Mining Section—31]

JANUARY, 1951

51

why the man has two hats...



He's a Gardner-Denver field engineer—keeps his "hard" hat handy for frequent trips underground—finds out "on-the-spot" just what results you expect from mechanized operations.

That's right, Gardner-Denver field engineers, you'll find, know *your* underground conditions from first-hand experience.

That's why Gardner-Denver equipment suits *your* needs so well.

**in scraper slushing,
for example . . .**

Production equals load per trip times trips per hour—so Gardner-Denver Airslushers are powered by the famous five cylinder air motor that lugs a full scraper at top speed—develops maximum speed and power in either direction.

- Finger-tip throttle control never tires the operator.
- Free-wheeling clutch needs no adjusting.
- Direct drive wastes no air between trips.
- Fewer parts—simple, rugged construction.

Write for full details on these and many other important Airslusher features.

SINCE 1859

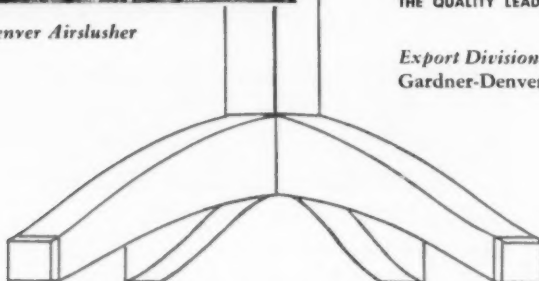
GARDNER-DENVER

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

Export Division: 233 Broadway, New York 7, N. Y., U. S. A.
Gardner-Denver Company, Quincy, Illinois, U. S. A.



Gardner-Denver Airslusher



INTERNATIONAL

to have been located near Ghandigarh, the site of the new Punjab capital. The reserves are estimated to be in the neighborhood of 25,000,000 tons. A survey was carried out to find out whether the erection of a cement factory near the capital site would be feasible. According to investigating geologists, few limestone deposits of such high purity as the present discovery have been found in Punjab.



WESTERN AUSTRALIA—The Prothero lead mine in the Northampton district has been bought by the Anglo-West Australian Mining Pty., Ltd., for the rumored amount of A£100,000. Anglo-West has been developing the mine since July and had an option to purchase. The firm's shareholders include the American Smelting and Refining Company, Mount Isa Mines, Ltd., The Mining Trust, Ltd., of London and Terra Nova Properties, Ltd., of Canada.

NORTHERN TERRITORY—The east drive at Noble's Nob mine was begun at a distance of 53 feet from shaft center off the north crosscut and advanced four feet in high values. Gold is visible in the face and the ore dips strongly to the north. Last August the company crushed 1,300 tons of ore for a recovery of 1,375 ounces of gold.

NEW SOUTH WALES—New Occidental Gold Mines N. L. is engaged in extensive diamond drilling at its mine at Cobar to prove the possible existence of large orebodies well below the present bottom level. Leases of the old Great Cobar mine were bought and this area also is being explored. If orebodies of similar grade as those now being worked are found and if they extend perhaps 4,000 to 5,000 feet below present workings, the company probably will cease existing operations and start a program aiming toward production of 1,000,000 tons of ore per year with an average grade of 2.2 cwt. gold and 1.2 percent copper.

FIJI—Emperor Gold Mining Company for the year ended June 30th made a profit of A£161,752 as compared with A£76,202 the previous year. Tonnage treated was 133,089 for a return of 52,928 ounces of gold valued at A£702,543. Silver recovery was 14,186 ounces. Loloma (Fiji) Gold Mines N. L. treated 22,486 tons of ore for a return of 21,383 ounces of gold valued at A£305,335. The company's invested profits returned A£47,389.

PHILIPPINES—The Marcelo Steel Company will receive the first of its orders for steel mill equipment in February. The steel plant to be erected will be at Punta, Santa Ana, on the Pasig river bank. The initial order consists of three electric furnaces, one ingot rolling mill, and one scrap re-rolling mill. The company has four engineers in the U. S. A. studying the latest steel mill practices.

NEW SOUTH WALES—North Broken Hill, Ltd., for the year ended June, 1950, treated 332,305 tons of ore (lead-zinc-silver) and Broken Hill South 286,670 tons.

QUEENSLAND—A commonwealth state investigation is planned in northern Queensland and will cover the Mt. Philip iron ore deposits, the Mt. Martin manganese deposits, and the Cloncurry copper district. An interest in the latter has been acquired by Broken Hill South, which has purchased the Trekalarno mine, an old-time producer in the area.

INDONESIA—The recent monetary measures have nearly doubled the prices in Indonesia, causing unrest and strikes among the employees, and other effects. The Billiton Company has advised that no new projects will be developed as a consequence, such as aluminum and nickel development which had been in mind.

QUEENSLAND—The pilot plant of the Titanium and Zirconium In-

dustries Pty. Ltd. is treating beach sands at Stradbroke Island. Primary concentration is effected by Humphrey spirals. The annual capacity of the plant is 1,500 tons of zircon concentrates and 1,500 tons of rutile concentrates.

INDONESIA—Rehabilitation of the gold mines will not be attempted until prices rise. At present the government pays F8310 per kg., not high enough to repair badly damaged and flooded mines. However, natives working the alluvial deposits are allowed to sell their gold on the black market and are obtaining good prices.

TASMANIA—The Government will spend £A200,000 over a period of seven years to accelerate mining investigation in the island along the lines of field investigations by geological and geophysical surveys, drilling, track cutting, and other work to enable areas to be properly proved before commercial mining by private enterprise is begun.



SOUTHERN RHODESIA—A deposit of monazite is reported to have been found at an undisclosed site by L. C. Byerley, a prospector who has been operating in the colony for the



BIG TASMANIAN ZINC WORKS EXPAND

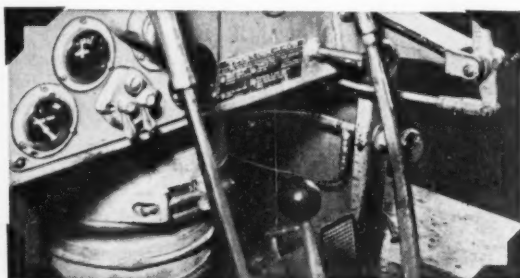
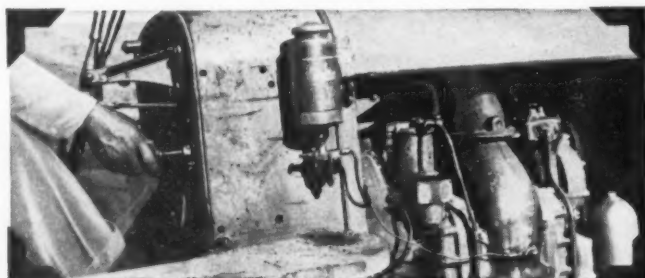
One of Tasmania's key industrial enterprises is the Electrolytic Zinc Company of Australasia, Ltd.'s works at Risdon, near Hobart. Products of the Risdon works have a total value of about £A2,500,000 a year at Australian prices and include an output—now being expanded—of about 85,000 tons of zinc a year, and about 17,000 tons of sulphuric acid, some of which is used to make superphosphate. Other products are cadmium, lead, silver, zinc sulphate and zinc dust, cobalt oxide and cobalt sulphate, manganese sulphate, manganese dioxide, and die-casting alloy. A big expansion project is under way including installation of facilities for the manufacture of ammonium sulphate, and a new low-frequency induction furnace for melting cathode zinc.

STANDARD ENGINEER'S REPORT

DATA

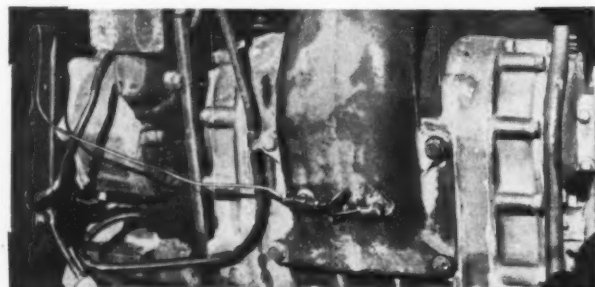
| | |
|------------|--|
| PRODUCT | Chevron Starting Fluid |
| UNITS | A. C. diesel engines ^{HD-7} tractors |
| CONDITIONS | 25° below zero weather— parked in open shed |
| EQUIPMENT | Permanent primer with atomizers on blower |
| FIRM | John W. Graves Heppner, Oregon |

Engine starts on first turn at 25° below zero!



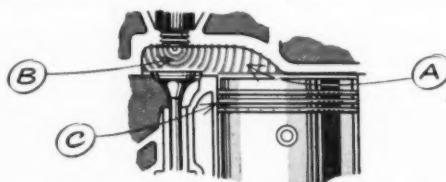
CHEVRON STARTING FLUID started this engine instantly every time during a severe Oregon winter, even when the tractor had been idle for several days in temperatures down to 25° below zero! John W. Graves, owner, says, "Power in the starter battery would last only for two or three revolutions

of the engine, but Chevron Starting Fluid required only one turn to kick it off." With one or two strokes of the dash-mounted pump, fluid was forced from the storage tank (left center) into the "blower", before the starter button was pushed.



ATOMIZER NOZZLES, as shown on this diesel "blower", are also used to inject Chevron Starting Fluid into intake manifolds of gasoline engines. Complete primer equipment may be purchased from your fluid supplier. Chevron Starting Fluid comes in 3-pint cans, and capsules of two sizes—7CC's and 17CC's, packed 12 and 24 per can. It is approved by leading engine manufacturers.

How CHEVRON Starting Fluid Starts Gasoline and Diesel Engines Instantly



- A. Atomizes in lowest temperatures and provides powerful, easily fired vapor in combustion chamber.
- B. Pressure, or the weakest spark, fires mixture—turns engine and heats air for regular fuel mixture.
- C. Contains lubricant and additives—prevent cylinder wear and ice formation in primer equipment.



FREE BOOKLET gives you more facts on Chevron Starting Fluid—shows where it should be applied in different type engines. Write or ask for it today.



TRADEMARK REG. U.S. PAT. OFF.

STANDARD TECHNICAL SERVICE checked this product performance. For expert help on lubrication or fuel problems, call your Standard Fuel and Lubricant Engineer or Representative; or write Standard Oil Company of California, 225 Bush St., San Francisco.

STANDARD OIL COMPANY OF CALIFORNIA

INTERNATIONAL

past 40 years. He expects to stake claims and visit the area with a government mining engineer before revealing further details.

KENYA—Through the Marshall Plan, \$129,150 will be made available for road building in Kenya to increase production and export of strategic materials, and agricultural and forest products. About 400 miles of new road will be constructed and about 500 miles of existing, graveled roads will be improved from Mombasa on the sea coast to Uganda, west of Kenya. Areas producing kyanite, graphite, and talc are among those which will benefit.

NORTHERN RHODESIA—*Rhodesia Copper Refineries, Ltd.*, plans to raise the capacity of its electrolytic refinery at Nkana from 65,000 long tons of electrolytic copper a year to 124,000 tons. The extra capacity is needed to treat growing output of the *Rhokana* and *Nchanga* mines.

FRENCH MOROCCO—The United States has contracted for 7,200 tons of cobalt concentrate from the *Societe Miniere de Bou Azzer et du Graara* of Casablanca to be delivered by November, 1952. The company's mines are located in the Anti-Atlas mountain chain near Ouarzazate, 300 miles from Casablanca, and ore is

trucked over the mountains to Marrakesh and thence travels by rail to Casablanca. Present Moroccan production of cobalt is around 3,000 tons yearly. Current modernization and development should increase that figure to 7,500 tons yearly by 1952. Principal buyers of Moroccan cobalt in the past have been French and Belgian nickel product manufacturers and France's leading producer of special steels, the *Societe Electrochimie d'Ugine*.

TANGANYIKA—A South African company, with an exclusive prospecting license over claims near Nanchinwea, southern Tanganyika, has started a drilling program to determine the extent of known copper orebodies.

SOUTH AFRICA—The *Nickel Corporation of Africa Ltd.*, which has holdings in Cape Province and elsewhere, is installing a crushing plant to handle a large tonnage of development ore. According to J. H. Wormell, chairman, development work has disclosed several high-grade deposits.

BELGIAN CONGO—*Cie. Geologique et Miniere du Ruanda-Urundi* (Georuanda) has installed enough new equipment at its property to in-

crease output soon to about 1,200 to 1,500 metric tons of cassiterite annually. Production in 1949 was 695 metric tons.

MOZAMBIQUE—Through a recent agreement reportedly concluded between the French Government and a Portuguese mining group, France received more than 100 tons of uranium ore from the Tete district and supposedly would continue to receive all the ore mined by the group.

NIGERIA—The *American Smelting and Refining Company* has agreed to assist in the development of Nigerian base metal properties. These are very extensive, but produce low-grade ores and have not been worked before on a large scale. American Smelting will carry out an extensive examination of the area owned by *Mines Development Syndicate (West Africa) Ltd.*, in Southern Nigeria. If earlier reports prove accurate, American Smelting will provide the bulk of the capital, believed to be about £5,000,000, needed to develop the mines. Principal shareholders of the Mines Development Syndicate are Gold and Base Metal Mines of Nigeria, Ex-Lands Nigeria, National Mining and the London and African Mining Trust.

PLACER MINING BUCKET LINE DREDGES TIN-PLATINUM-GOLD

SCREEN PLATES
PUMPS



BUCKET PINS
JIGS

YUBA MANUFACTURING CO.

Room #710, 351 California St., San Francisco 4, Calif., U. S. A.

AGENTS: (Sime, Darby & Co., Ltd. Singapore, Kuala Lumpur, Penang.)
(Shaw Darby & Co., Ltd., 14 & 19 Leadenhall Street, London, E. C. 3.)
Cables: Yubaman, San Francisco... Shawdarbeco, London

Use **FLEXIPIPE** . . . the quality ventilating tubing



FLEXIPIPE

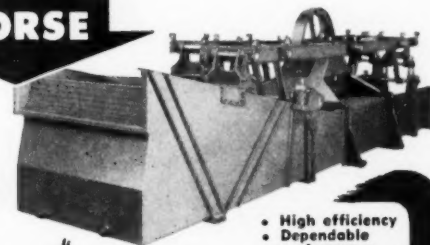
Directs fresh air where you need it

The new improved Flexipipe is efficient, serviceable and economical. It's made in a variety of diameters and lengths and with various accessories to take care of your individual requirements. Write us for complete information and sample.

BEMIS BRO. BAG CO.
412 Poplar St., St. Louis 2, Mo.

FLEXIPIPE: Reg. U. S. Pat. Off.

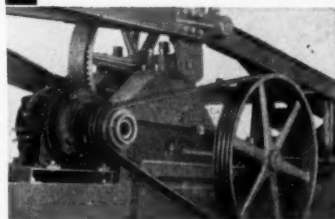
MORSE



"Trueline"

RAKE CLASSIFIERS

DEPENDABLE CLASSIFIERS THAT IMPROVE
PERFORMANCE, SIMPLIFY OPERATION AND
LOWER MAINTENANCE.



Large and quiescent pool areas give high overflow efficiency. Long "Trueline" strokes, parallel to the tank bottom, discharge the maximum quantity of sands. Fabricated steel construction gives extra strength and long service.

COMPACT DRIVE
SMOOTH OPERATION
METALLURGICALLY RIGHT

WRITE FOR
BULLETIN



MORSE BROS. MACHINERY COMPANY

ESTABLISHED 1898

DENVER, COLORADO, U. S. A. (CABLE MORSE)



NORTH AMERICA

ONTARIO—*Steep Rock Iron Mines, Ltd.*, at Steep Rock Lake, has increased production to 9,000 tons of iron ore daily. From January 1, 1950, through November 23rd, when weather terminated mining operations for the season, production was 1,216,614 tons, a figure exceeding total 1949 production. If weather permits this winter four drills probably will be used to explore the 6,000-foot area between the "A" and "B" orebodies (the *Hogarth* and *Erington* mines, respectively) where a limited drilling program last year proved the existence of ore. Dredging of up to 40,000,000 yards of silt and clay from the 3,500-foot long "A" orebody has been started by Construction Aggregates Corporation of Chicago, Illinois. The dredge has a maximum lift of 400 feet; rate will be about 2,000,000 yards monthly. This season the south pit of the "B" orebody has been providing all production. The "B" has a proven length of 4,000 feet and an average width of 125 feet; underground work to include sinking a three-compartment shaft to an initial depth of 1,250 feet has begun. Stripping of the north pit of the "B" orebody is well under way in preparation for mining in the coming season.

NEW MEXICO—The *Southwest Potash Corporation* will construct a refinery and sink a shaft in the Carlsbad area for a future annual production of 185,000 tons of potash. The plant will cost about \$10,000,000 and will begin operating in 1952. Four other large-scale potash operations are either operating or preparing to operate in the area, now one of the world's largest producers of potash minerals.

ONTARIO—About 235 feet of a total of 940 feet of *Ranwick Uranium Mines Ltd.*'s new adit at its Sault Ste. Marie mine appears to be of mineable grade. The adit was driven along the Ransom diabase dike and if bulk sampling is up to expectations a shaft will be sunk to open a deeper level. According to L. J. Lichty, metallurgist, an 85 percent recovery of uranium oxide is possible by jigging, table concentration, and flotation. The company is installing a portable crushing plant to treat a stockpile of 700 tons of ore from which samples will be sent to Ottawa for mill testing and assaying. Originally the mine was explored by surface bulldozing along the dike where pitchblende was found in three main shear planes as well as in several fractures. The new adit was driven 130 feet below the showings and is the beginning of an underground program which will include extensive crosscutting and testing.

MONTANA—The new precipitation plant of the *Anaconda Copper*

Mining Company near Butte has been producing about 500,000 pounds of copper monthly from more than 900,000 tons of mine water fed into the plant. Every ton of water contains about six-tenths of a pound of copper and the plant extracts between 92 and 94 percent of that amount, according to H. J. Rahilly, mine manager. The best precipitants are shredded tin cans, of which 1¾ pounds are used per pound of copper precipitated.

BRITISH COLUMBIA—*Western Gypsum Products Ltd.* will build a \$40,000 perlite crushing mill this spring at Francois Lake. H. F. Baker, vice president of mining and production, has announced. A road has been built to the mine, 19 miles from Burns Lake, and an "unlimited" quantity of perlite has been found, he said.

CANADA—Three more companies are planning to construct mills at their properties: The *Western Uranium Cobalt Mines Ltd.*, Hazelton, British Columbia; the *Bevcourt Gold Mines Ltd.* at Bourlamaque, Quebec; and the *Bellekeno Mines* at Keno Hill, Yukon Territory. At Western Uranium's gold-uranium-cobalt property, enough ore has been indicated in the Rocher de Boule mine to warrant a mill of 150 tons capacity. Of the four levels in the mine, three have been extensively sampled, and the fourth, where the most promising vein exists, now is being actively developed. At Bevcourt's mine about 1,000,000 tons of gold ore have been indicated, 50,000 tons have been bulk-sampled at the *Perron Gold Mines'* mill, and the discovery of a stringer zone on the 700-foot level possibly may add 200,000 more tons to estimated reserves. Although the decision to construct a mill is not definite, present indications have stimulated plans for one. Bellekeno purchased a complete plant at Mayo and has moved it to the Keno Hill area. Although only a small part of the property has been prospected, good values in silver and lead have been found in two prospect shafts put down to a depth of 105 and 47 feet, respectively, and in several open pits. The company plans to drive an adit along the vein opened by the shafts and to bulldoze several silver showings on the *Eureka* and *Chance* claims to provide mill feed.

ALASKA—Closed down for the season are the following mining companies and mines: *Wrede Brothers'* Deadwood creek operation; *Yukon Placers*; *C. J. Berry* dredge, which operated on Mammoth creek; *Helcolicon Mines*, which dredged on Klery creek; *Ganes Creek Mining Company*; *Alluvial Golds, Inc.*, which dredged on Coal creek and stripped at Woodchopper creek; and others.

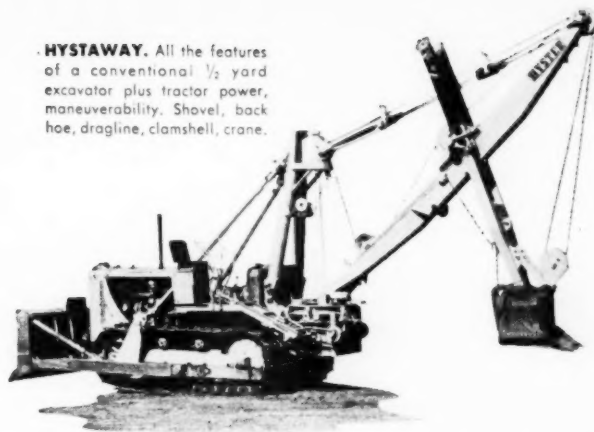


INCO'S NICKEL PRODUCTION NEARS PEAK

The picture shows the triple stacks of the International Nickel Company's smelter at Copper Cliff, Sudbury district, in northern Ontario, Canada. Inco has reported that earnings in the three months ended September 30 totaled \$58,795,985, nearly equal to the all-time peak in 1937. Demand for nickel is so great at this time that nickel-copper production has been upped to the capacity of the company's facilities. Development of the new marginal ore operation at the Creighton mine in the Sudbury district is being hastened. Soon to be installed at the mine is a new 9,500 hp. hoist manufactured by Bertram-Nordberg; the hoist, which weighs over 250 tons, has a maximum vertical lift of 4,100 feet at a hoisting speed of 3,000 feet per minute.

29

HYSTAWAY. All the features of a conventional 1/2 yard excavator plus tractor power, maneuverability. Shovel, back hoe, dragline, clamshell, crane.



HYSTER TRACTOR TOOLS

Any one of them makes your
"Caterpillar" Diesel Tractor

do double duty

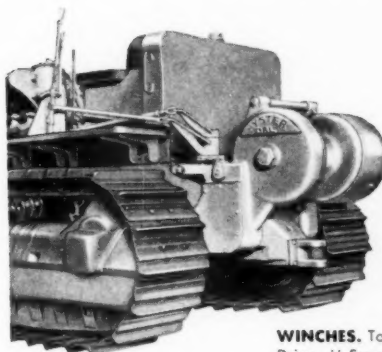
Mounted on either a new or an old "Caterpillar" Diesel Tractor, a Hyster tractor tool gives a greater range of uses and increases your profit possibilities.

The current line of 29 Hyster Tractor Tools includes the Hystaway; the Grid Roller; and a complete line of winches, yarders, donkeys, cranes, logging arches and sulkies.

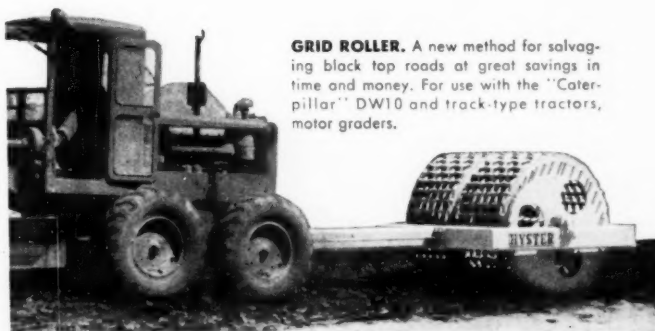
Your "Caterpillar" distributor sells and services Hyster tractor equipment. See him for information or write for catalogs. The coupon is for your convenience.

HYSTER® COMPANY

2902-80 N. E. Clackamas, Portland 8, Oregon
1802-80 North Adams Street, Peoria 1, Illinois



WINCHES. Towing, Utility, Worm Drive, HySpeed. A complete line for "Caterpillar" Diesel Tractors.



GRID ROLLER. A new method for salvaging black top roads at great savings in time and money. For use with the "Caterpillar" DW10 and track-type tractors, motor graders.

HYSTER COMPANY

2902-80 N. E. Clackamas St., Portland 8, Oregon

Please send catalog on HYSTER Tractor Equipment for

☐ Construction ☐ Industry ☐ Oil Fields ☐ Heavy Logging ☐ Light Logging

Name

Address

City Zone State

INTERNATIONAL

Starting winter operations is Earl Pilgrim, who has an antimony property near Stampede. He has a new landing field to use this year and will have Bob Rouse, Daniel Hunnicut, and Leo Ferrari working with him.

MICHIGAN—Work is beginning on Jones & Laughlin Ore Company's new underground mine, the Tracy, near Negaunee. The first shaft to be sunk will be 1,600 feet deep and provide access to all the company's orebodies in the area. Later this shaft may be sunk to a depth of 2,500 feet. When in operation, the mine is expected to produce 1,000,000 tons of iron ore annually and provide employment for 650 men.

ALASKA—The United States Tin Corporation has sent the first of two shipments of cassiterite (tin oxide) from its mines at Tin City, Alaska, to Seattle, Washington, according to H. R. Fischnaller, president. The initial shipment weighed 100 tons.

QUEBEC—An entirely new zone of gold, zinc, silver and copper ore has been discovered by diamond drilling at depth at Quemont Mining Corporation's mine in the Noranda-Rouyn area. Drilling was from the 1,260 level. The orebody has an estimated length of from 300 to 400 feet.

ONTARIO—A gold rush in the Sioux Lookout area has been reported by Mines Minister Welland S. Gemmel. Sioux Lookout is 150 miles northwest of Port Arthur. The gold was found on Neepawa Island in Minnitaki Lake and is about 20 miles east of the Newlund Mines property. Government geologists said the deposits examined look very promising.

OHIO—The Youngstown Sheet & Tube Company plans to spend between \$8,000,000 and \$9,000,000 on improvements to its plants in the Youngstown area, according to Frank Purnell, chairman of the board. The project is part of a future plan to modernize and improve all the company's plants at an estimated cost of \$100,000,000. However, such an

amount will not be spent soon and cannot be spent in its entirety unless steel prices go up.

IDAHO—The Sidney Mining Company is sinking a three-compartment shaft from the Red Cloud tunnel level and 2,000 feet from the Red Cloud portal at its Kellogg, Idaho, mine. Three crews are engaged and have sunk over 150 feet so far at a rate of about five feet per day. A station will be cut at the 200-foot level. The company has installed a new 450 hp. double-drum hoist for the work. Sidney mined 63,499 tons of lead-silver-zinc ore in 1949 with a return of \$3,091,208, making it the leading producer in the Pine Creek district.

ALASKA—Other victims of Alaska's water shortage are Fred and Fritz Weinard, who have closed their Jump Creek operation and started prospecting. They are reported to have found a new pay channel, however, and will resume mining there if the water situation is relieved.

IDAHO—At Lucky Friday Silver-Lead Company's mine, Mullan, a 300-foot crosscut from the main shaft station on the new 1,800 level has encountered the downward extension of a vein mined on the 1,600 level above. According to John Sekulic, president, the face measures about 12 feet square and in the richest section samples have assayed 44.0 percent lead, 4.6 percent zinc and 67.2 ounces of silver per ton. The company will crosscut to a point slightly beyond the vein and then start drifting easterly. On the level above a parallel drift opened about 350 feet of ore, and a similar structure is expected on the 1,800 level.

ONTARIO—Madsen Red Lake Gold Mines completed sinking its main shaft to a 2,950-foot depth not long ago and now is crosscutting on six new levels at its mine at Madsen. Along with this development work a production rate of 800 tons per day is being maintained. (In the quarter

ended September 30, the company milled 74,229 tons with a value of \$660,618.) The crosscuts will not reach the ore zone until next June, and ore passes between levels must be cut meanwhile. However when development is completed the company will have what amounts to an entirely new mine from which to produce.


BRITISH COLUMBIA—Exploration at Rico Copper Mines Ltd.'s property near Laidlaw has been showing encouraging values. Of 24 diamond drill holes amounting to 1,500 feet in total length, all holes struck ore containing copper, gold and silver. The drilling program is being done in order to test known orebodies at depth, and results seem to show that surface values continue to appear equally good at depth. Rico will continue exploration and development throughout the winter. Supplies have been brought in by helicopter and a permanent camp built. In charge of the program is Uno Sehenin, state geologist for Montana and geology professor at Montana School of Mines.


MONTANA—The idle copper mines of the North Butte Mining Company at Butte, Montana, are being reopened with a final production objective of 5,000,000 pounds of copper annually. The company will use one of the largest deliberate leaching programs ever conducted in order to recover this amount of cement copper. I. E. Serigstad, general manager, and C. L. Van Alstine, chief engineer, developed the plans for the leaching project.

ALASKA—The Franklin Mining Company has completed dredging work on Chicken Creek for the season and is starting winter freighting. Howard Bayless and Dick, Ellis and Bob Roberts run the company and lease two claims on ground owned by Fred White. The company's equipment includes a D-8 Caterpillar, dragline, and D-13,000 pumping unit.

QUEBEC—Near its Moulton Hill mine, Ascot Metals Corporation Limited is sinking a three-compartment shaft on the property of the wholly-owned subsidiary company, Suffield Metals Corporation Limited. Three levels, the first to be established at a depth of 225 feet, cross-cutting, and drifting on the ore zone indicated by diamond drilling should be completed on or about April 1, 1951. The ore zone having been verified, work will start on the acquisition and installation of a permanent mining plant capable of 1,000 tons daily; a crushing plant of like capacity and a concentrator with an initial capacity of 500 tons daily with housing facilities for an increase to 1,000 tons will be installed also. Frederick E. Hall is Ascot's mine manager.

SuperDuty
DIAGONAL DECK
No. 6
CONCENTRATOR
TABLE





HIGHER EFFICIENCY FOR 1951

Higher grade concentrates, leaner tailings, more new feed per day and exceptionally low operating and maintenance costs . . . these are but a few of the many reasons why the SuperDuty Diagonal Deck Concentrating Table, by the increasing acceptance of the past ten years, has been acclaimed the leader in its field. Make its advantages yours in 1951.

Send for Bulletin 118A

THE DEISTER CONCENTRATOR CO.
The Original Deister Co., Incorporated 1906
925 Glasgow Ave. Ft. Wayne, Ind., U. S. A.

TROUT REBUILDING

Continued from Page 35

closer to the main belt; the fourth pole, run at a strength of 150,000 AT and at a height of only 1/8 inch, picks up virtually all the manganese dioxide on the main belt and leaves a tailing product which contains only about 8 percent manganese dioxide.

The product from the third pole is divided into a middling (metallurgical grade) and a concentrate by dividing the stream of falling manganese dioxide with an adjustable splitter—the oxide which carries farthest is battery grade and that which falls closest is metallurgical grade.

In addition to the adjustment of the rate of feed, four quick adjustments can be made on the magnetic separator:

1. The strength of each pole can be varied by a change in the current to the pole.
2. The distance from each pole to the main belt is adjustable.
3. The speed of each cross belt is adjustable.
4. The speed of the main belt is adjustable.

The flexibility provided by these adjustments allows for close control of the grade of concentrates and middlings, and of the overall recovery of manganese dioxide.

Dry Mill Returns to Trout

In 1937, with ore from the mines low in manganese-dioxide content, Trout Division built the district's first wet manganese-dioxide mill—dry milling, by then-existing means, would no longer produce a battery-grade product. Today, with improved and refined equipment for magnetic separation, Trout has returned to dry milling of some ores, and is processing 25 tons per day in the new dry section of the plant; by that addition, total mill capacity has been upped from 50 to 75 tons per day.

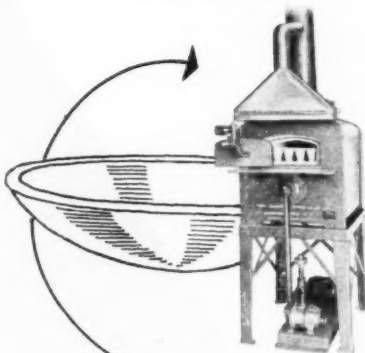
The dry-milling plant consists first of a 100-ton primary orebin from which ore is gate-fed to a 9 by 12 inch Colorado Iron Works Company jaw crusher. The minus-2-inch crushed product is carried on a 14-inch belt to a 20-inch tray or gyratory crusher which discharges the minus-3/4-inch product into a 30-ton storage bin. Gate-fed from the storage bin, the minus-3/4-inch material falls to a 14-inch belt, is carried to the Ruggles-Cole drier, and passes through the final retreatment plant.

Trout Looks Ahead

Today, Trout Mining Division is extending its rehabilitation program to its mines in an attempt to boost production of vitally-needed manganese dioxide. The Algonquin "Gonk" shaft is being dewatered, and Trout is cooperating with the U. S. Bureau of Mines in an effort to extend its reserves. No amount of adversity will keep this company, with its well-knit spirit of cooperation, from growing.

ACCURATE ASSAYING

DEMANDS PRECISION MADE EQUIPMENT AND QUALITY CHEMICALS



DFC

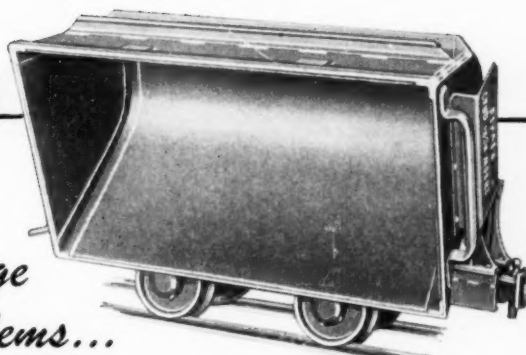
The DENVER FIRE CLAY Company
EL PASO, TEXAS NEW YORK, N. Y. SALT LAKE CITY, UTAH
DENVER, COLO. U. S. A.

Whether you need an assay furnace or a cupel; flotation reagent or test lead, call on the Denver Fire Clay Company, pioneer suppliers of assay equipment and supplies.

For quality products and utmost in service!

DUMP

your
haulage
problems...



on Experienced shoulders!

CARD CARS are engineered to combine operating ease and speed with rugged build that can take severe service.

Furthermore, they are engineered to meet specific conditions in YOUR mine!

Ask for Bulletin RD-1

C.S. Card Iron Works Co.



Denver 1, Colorado

NEW METHODS—NEW EQUIPMENT

FREE MANUFACTURERS' LITERATURE

SCREEN CLOTH: Released by Hewitt-Robins, new information describes Super-Gyaloy Screen Cloth with 3/16- to 6-inch openings in 12-gauge wire to 3/8-inch rod. Get Bulletin No. 113-A-MW fully describing Super-Gyaloy by writing to MINING WORLD.

MINERALIGHT: For detection of uranium, scheelite, mercury, zinc, zirconium, thallium and other minerals, the Ultra-Violet Mineralight, costing from \$34.50 in field models, or from \$12.50 in lab models, is described in a new folder, MINERALIGHT-MW, now available from MINING WORLD.

DIAMOND DRILL: The new 2400-lb. Harinck Hydraulic Diamond Drill and the "Hydraulic Brain," which limits spindle motion and automatically adjusts drilling pressures as changes in rock are encountered, is fully described in a new 4-page two-color bulletin, "Harinck Hydraulic Diamond Drill," now available from MINING WORLD.

OFF-HIGHWAY TRUCK: A new catalog folder on the Model 1UD Rear-Dump Euclid has been published. The unit is powered by a 125-hp. diesel engine, has a payload capacity of 20,000 lbs., and is the smallest off-highway hauling unit built by Euclid.

MOBIL-MILLS: In four pages and two colors, a new booklet describes application, construction and design, size availability, operating results, and advantages of the WEMCO Mobil-Mill for heavy media separation. Write to MINING WORLD for Bulletin No. M-3-M-3, WKE Mobil-Mill.

DIESEL: Users who need neither a high-speed automotive diesel nor a heavy, slow-speed, de-rated engine will be interested in the 6- or 8-cylinder in-line series of TS diesels now being produced by the Ingersoll-Rand Company. Additional information on this unit, which delivers 195-375 hp. at 900-1,000 rpm., can be obtained by writing for Ingersoll-Rand TS Diesel Data, MINING WORLD.

BULLDOZER: The U-shaped bulldozer, designed for universal use in a variety of earth-moving applications with the Caterpillar Diesel D8 track-type tractor, has been added to the heavy earth-moving equipment line of Caterpillar Tractor Company. Write MINING WORLD for more information.

CRAWLER: Complete with illustrations and cutaway views, a new catalog explains the torque converter, General Motors 2-cycle Diesel engine, and track design of the HD-19 Allis-Chalmers crawler tractor. Write to MINING WORLD for 24-page catalog.

SHEAVE BLOCK: Detailed information on Alloy Steel & Metals Company's new "Round-the-Corner" sheave block, which allows cross slushing from a single setup

of a double-drum slusher hoist, is available from MINING WORLD.

CONVEYOR: Stephens-Adamson Company's Natural Frequency Conveyor is designed for use where vibration transmitted to supporting structures is a problem. It includes such features as low power consumption, low stress coil springs, and rubber bushings requiring no lubrication. Write for Bulletin No. 950.

Copies of all bulletins may be obtained by writing MINING WORLD, 121 Second St., San Francisco 5, Calif. Please refer to bulletin number and issue in which it appeared.

AIR COMPRESSORS: Worthington Pump & Machinery Company has introduced two new Blue Brute portable air compressors. Hand truck and trailer models are featured. For further information write MINING WORLD.

MINERAL JIG: Denver Equipment Company's bulletin J2-D8 describes the new selective mineral jig which treats unclassified and unsized feed. Write MINING WORLD for a copy.

TRACTOR SHOVEL: The LODOVER, a new 1-yard combination overhead and front-end shovel for International Harvester tractors, is fully described in a new 8-page illustrated catalog just released by Service Supply Corporation, Philadelphia, Pa. T-9 owners should get their copy of Bulletin LO-200-MW by writing to MINING WORLD.

ROCK DRILL: Information on Sandvik Steel, Inc.'s new line of lightweight Coromant rock drills and carbide-tipped drill steel will be sent to you upon request from MINING WORLD.

CLASSIFIER: Deister Concentrator Company's Bulletin No. 210 covers Concenco SuperSorter. Write for your copy.

Curved Design Increases Life of Crusher Plates

Curved jaw-crusher plates, the same ones which are standard on all Traylor jaw crushers, are now available for installation in other makes of crushers. In the new design, the curve of the fixed jaw is convex and the curve of the movable jaw is concave at a point approximately one-third of the way up from the discharge point. Traylor Engineering & Manufacturing Company, Allentown, Pa., reports that the curved plates, by eliminating choking, packing, and by using crushing power more efficiently, last three times longer than ordinary plates.

To see how easily the new plates can be installed in their present crusher, crushermen should request information "Traylor Curved Plates" from MINING WORLD.

Cable Fault Finder for Locating Shorts or Opens

The Mines Equipment Division of Joy Manufacturing Company announces availability of a fault finder that permits quick location of short circuits and open-type faults in cable. Numbered M-70-M, this new unit requires no technical training or complicated calculations to operate. Lightweight transmitter and receiver are designed to operate on batteries and consequently require no external power connections.

Bulletin Number F-28, describing this new Joy product, is available, without obligation, to all interested parties. Write MINING WORLD, 121 Second Street, San Francisco 5, Calif., for a copy.

New Reduction Crusher Has Been Released

The Mine & Smelter Supply Company has manufactured a laboratory or pilot plant reduction crusher designed to reduce 1/2-inch feed to as fine a product as 10 mesh, single pass. It provides an operation and product comparable to that obtained by commercial reduction crushers. Product is ideal feed for ball or rod mills, laboratory pulverizers, or gravity concentration operations such as tables, jigs, sink float, or spiral concentration and sizing analysis and sampling.

This machine, developed by Dr. Fahrenwald of the University of Idaho, replaces such bulky and unhandy equipment as rolls and the coffee mill. It is compact, having extremely high capacity and very low power consumption. It is manufactured in two sizes, 6 inches and 10 inches, requiring 1/2 and 1 hp. respectively.

Gear Design Reduces Wear and Vibration

Allis-Chalmers announces newly designed gear drives which will be used as standard equipment for grinding mills, coolers and dryers. The new design provides 75 percent more tooth area, and so distributes wear over a greater space.

The profile of teeth, known as a true involute, reduces vibration by keeping gear velocity uniform; by providing more rolling action between teeth, with less sliding action, wear is reduced. Reduced tooth pressures permit better lubrication. Write MINING WORLD for more information.

SILVER

A Letter to a Congressman

You are now busy in a new session of Congress. As usual, some member is certain to present a bill asking for the repeal of the Silver Purchase Act. For the last fifteen years our Treasury has been beguiled by the Keynesian financial fantasies. Our treasurers have not studied the Arabic motto, "Consider well the end." Mark well the plight of Britain!

When Moses, the lawgiver, was founding a nation, he settled the money question by establishing a tangible standard of value. Approximately one-half an ounce of silver was a silver shekel and the same weight of gold was a gold shekel. Even in that early day bi-metalism had already proved its worth during tests centuries-long. Moses also knew his people and determined that, while he lived, there should be no profiteering. He said, "A homer of barley seed shall be valued at fifty shekels of silver." Today some of our people fear price-fixing "because it is so new and untried."

How little the world has really changed is astonishing. Over thirty centuries ago Moses said that cleaned barley was worth \$2.92 per bushel. Today a bushel of wheat sells for \$2.27 while one of soybeans sells for \$2.90. The need for true bi-metalism, as a stabilizing influence, is even greater today in a world that is slowly drowning in a flood of fluctuating money that is backed only by a prayer and a hope.

Let us now consider silver as an ordinary commercial commodity, which is daily becoming more important both in peace and in war. It seems to be difficult for people, even in Congress, to understand that silver is seldom found by itself in ores. It is almost invariably found in association with other metals in different forms. In the whole United States there is only one mine of moderate size that is operated with silver as its principal product.

From the above statement it is apparent that when we are about to consider the silver question we must also give consideration to other metals such as copper, lead, and zinc. In the ores of these three metals silver is the one other metal that is most constantly associated with them. Cost of production is the one deciding factor in putting these metals on the market. In figuring this net production cost of any or all of them the sale price of silver is usually the deciding item that makes the operation possible. The average nonferrous metal mine is operated on a smaller margin of profit than any other industry. Constant operation and a large tonnage production are necessary to success.

To illustrate our point we use a normal peacetime year. In the metal production of 1941 in Arizona, each single ounce of silver purchased brought with it a correlated production of 96 pounds of the base metals. In Utah that ounce of silver brought out 66 pounds of other metals, and in Montana 36 pounds. In these three states it was only the silver that enabled them to produce 722,027 tons of copper, 107,460 tons of lead, and 111,530 tons of zinc in 1941, and without the silver sales that total could not have been reached. In Arizona the main production was copper, being 332,750 tons. Here the silver also played another role. In order to recover that tonnage it was necessary to have 93,374 tons of fluxing ore. And 259 small shippers supplied the added tonnage. To have used barren rock for fluxing would have made the whole operation unprofitable. The fluxing ore carried an average of 0.12 oz. gold and 5.67 oz. silver per ton, which was just enough to save the operation. Here again we see that it was due to the presence of a small content of silver throughout the operation from mine to metal that made possible a tremendous tonnage of base metals for ships, tanks, planes, and guns, as well as the whole range of peacetime industry.

The Wanderer

JANUARY, 1951

T
R
O
N
A

SODA ASH

a quality product

÷

AMERICAN POTASH & CHEMICAL
CORPORATION

3030 W. Sixth Street, Los Angeles 54, California

Available NOW

NEW

**Spiral-Weld
STEEL PIPE**

4" to 12" O.D. • 10, 12, 14 Gauge
20' & 40' Lengths • Choice of Ends
{ Can be supplied up to 36" O.D. }
60 to 90 day delivery }

**HIGH TEST LIGHT WEIGHT
ECONOMICAL LAID COST**

For Air, Gas, Oil, Steam, Water Lines

★

Send specifications for estimate
or write for folder

PACIFIC PIPE COMPANY

407 FOLSOM STREET
SAN FRANCISCO 5

If it's made of pipe we can make it

precipitates—CENTRAL and EASTERN

Oliver to Open New Iron Mine Near Coleraine

Oliver Iron Mining Company will open a new mine, to be known as the King, in the Coleraine area of Minnesota early this winter, R. T. Elstad, president of U. S. Steel's mining subsidiary, has announced. The new mine extends southwest of the present Canisteo openpit mine and is located north and west of Coleraine near Oliver's Canisteo district headquarters shops.

The King mine, named for the late Alexander King, former general superintendent in charge of Canisteo district operations, will be a combination openpit rail and truck operation. Mine approach tracks have necessitated a double rail underpass beneath the Duluth, Missabe & Iron Range Railway main line. The approach connects with trackage from the Walker mine to stripping dumps south of Coleraine. Over 15,000,000 cubic yards of glacial dirt and 3,000,000 cubic yards of waste rock must be removed to expose the orebody at the King mine and will be deposited on a dump south of the pit and on the present Walker dumps.

Ore from the King mine is typical of the crude, sandy material predominant on the western Mesabi. Low in iron and high in silica (sand), it is

unfit for steel making until it is first beneficiated at the big Trout Lake concentrating plant. Rail tracks from the King mine to the concentrator will pass north of the Canisteo headquarters shops about a block from the log house built and occupied at one time by John C. Greenway, an Oliver superintendent of 40 years ago, who plotted Coleraine and laid out many mining plans for the western Mesabi.

Bringing in the King mine is another step in Oliver's continuing attempts, through costly beneficiation methods, to make low-grade ores usable for steel making.

Jones & Laughlin to Open Million-Ton-Per-Year Mine

About 50 years ago the Jones & Laughlin Ore Company was a major producer of iron ore on the Marquette range of Michigan; but since 1919 the company has obtained most of its ore supply from the Mesabi range and from the more recently-opened Benson mines at Star Lake, New York. Now Jones & Laughlin is preparing to open and develop the Tracy mine at Negaunee, Michigan, on property acquired in 1921 from the Breitung interests.

The company has carried on a

diamond-drill exploration program at the property for the last ten years. This drilling has been somewhat unusual in that about 80 percent ore recovery—including ore zones—has been obtained. Ore proved up by the exploration has been sufficient to warrant plant construction. A centrally-located shaft, the Tracy shaft, will be sunk to an initial depth of about 1,600 feet and eventually to 2,500 feet and will serve all the company's orebodies in the Negaunee area. According to Harry S. Peterson, general superintendent, a production rate of 1,000,000 tons per year is planned and about 650 men will be employed.

New Jersey Zinc Opening Old Pa. Zinc Mines

The New Jersey Zinc Company is opening its Friedensville, Pennsylvania, zinc mines after a shutdown of 58 years. The mines, originally discovered in 1845, lie in the Saucon Creek valley just south of Bethlehem, Pennsylvania. New Jersey Zinc began diamond drilling the property in 1923 and completed drilling in 1945. After World War II the company began shaft sinking; a depth of 675 feet has been reached now, and plans call for further sinking to 1,250 feet. Excess water, one of the major deterrents to working the mines in the past, is kept out by forcing fluid cement into crevices and rock fractures.

The company has begun erecting mine buildings, including a flotation mill, and is equipping the property with mechanical shovels, electric-powered scrapers, heavy electric locomotives and machinery. Zinc ore will be crushed at the bottom of the shaft and then hoisted to the mill. Concentrate from the mill will be shipped to the company's Palmerton, Pennsylvania smelter.

The entire project will take at least two years and will cost several million dollars.



BLOCKHOLING AT J&L'S NEW YORK MINE

After iron ore has been blasted, some pieces are still too large for the shovel and crusher to handle at Jones & Laughlin Steel Corporation's openpit mine at Star Lake, New York. The very hard boulders such as the ones above must be drilled and blasted individually and then must undergo extensive processing. The rock is crushed to sand size, the iron separated from waste by magnetic separators, and the crushed ore then fused by mixing it with coal and subjecting it to high temperature—i.e., sintering.



For at least thirty years the lands of *The Lehigh Coal and Navigation Company* at Mauch Chunk, Pennsylvania, have been known to contain uranium. Within the last few years the company, representatives of the

MINING WORLD

Federal Government, and geologists from Lehigh University have gone over the property with Geiger counters. There is little question but that there is uranium, but it is in very thin veins or sections, from $\frac{1}{8}$ inch to $\frac{3}{8}$ inch thick, and they go down almost vertically into the earth. The company is about to do some diamond drilling to discover whether the veins continue straight down, flatten out, or disappear. The best geologists think that because of the formations in the territory that the veins disappear. The company is not optimistic, but intends to spend some money in diamond drilling to find out the facts.

The New Jersey Zinc Company advises in its third quarter report that its Research Division's experimentation to find a method of extracting zinc by electric arc smelting has been very encouraging. As a result further experimental work is being done to confirm the company's opinion that the process effects better recoveries at lower prices under certain conditions.

Brown iron ores in Mississippi may be commercially valuable, according to an announcement by the U. S. Bureau of Mines. Robert A. Laurence, regional geologist at Knoxville, Tennessee, has made preliminary investigations of the Eocene Wilcox formation which outcrops northward from Choctaw County to Benton County Mississippi. The ore occurs generally as large concretionary masses of limonite in surface deposits which might be mined profitably by large-scale openpit methods. Further prospecting to confirm these beliefs has been suggested.



At its Lorain, Ohio, yards the American Ship Building Company will build a huge ore carrier—the largest inland waterway ship ever constructed—for the M. A. Hanna Company. The ship, to be ready for the 1952 ore season, will cost about \$6,000,000 and will be 690 feet in over-all length, 12 feet longer than Inland Steel's new Wilfred Sykes which went into service this year. Capacity, at present Great Lakes drafts, will be over 20,000 tons with a speed of about 16.5 miles per hour.

Stripping has begun at the St. James mine at Aurora, Minnesota, by Oglebay, Norton & Company, operating agent for the St. James Mining Company. The mine was last operated in 1924 by the Corrigan, McKinney Steel Company as an underground mine, but operations now are by the shovel-truck method. B. L. Knudsen, formerly at the Eureka

JANUARY, 1951

**Bear
Brand
Xanthates**
bring . . .

Uniformity



BEAR BRAND XANTHATES

available

- Z-3—Potassium Ethyl Xanthate
- Z-4—Sodium Ethyl Xanthate
- Z-5—Potassium Amyl Xanthate*
- Z-6—Potassium Pentasol Amyl Xanthate*
- Z-8—Potassium Secondary Butyl Xanthate
- Z-9—Potassium Isopropyl Xanthate
- Z-11—Sodium Isopropyl Xanthate

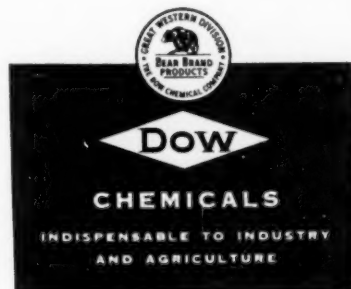
*From Sharples Amyl Alcohols

The constant uniformity of Bear Brand Xanthates is one of the outstanding characteristics of these widely accepted flotation reagents.

Users know that any single drum or carload of drums can be depended upon to show the same quality as previous or subsequent shipments.

**"Over Twenty-five Years Experience in Producing
Xanthates for Metallurgical Use"**

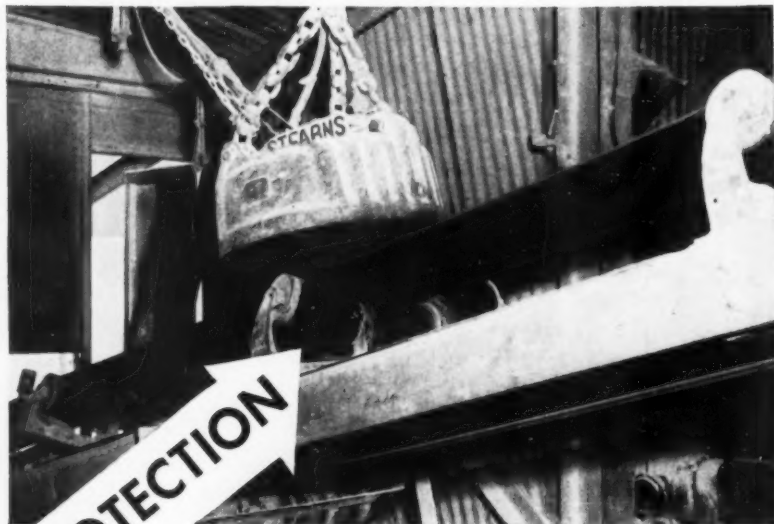
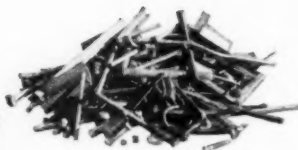
**THE DOW CHEMICAL
COMPANY**
San Francisco 4, California
U. S. A.



REMOVE TRAMP IRON

WITH *Stearns*

SUSPENDED MAGNETS
LOWEST COST WAY



PROTECTION

SAVES MONEY!

Here's the economical way to protect crushers, grinders, pulverizers and other vital equipment — use a STEARNS Suspended Magnet over your conveyor belt or head pulley. This STEARNS Circular Suspended Magnet is one of two installed at the National Gypsum plant at Savannah, Ga., to remove all tramp iron before the rock enters the crushers.

You can protect your machinery and purify your product the low cost, positive way. Eliminate all tramp iron with STEARNS Suspended Magnets — this means fewer repair bills on crushing equipment, fewer shutdowns and higher production.

Whether you are handling rock, slag, coal or ore, investigate STEARNS Suspended Magnets; they're easy to install and have low operating and maintenance costs. Write today for descriptive literature on both circular and rectangular suspended magnets.

Complete laboratory and testing facilities available for separation tests on your materials.



STEARNS Circular Suspended Magnet for inclined installation over head pulley.



Rectangular Suspended Magnets available in sizes and shapes to meet your requirements.



Stearns

**MAGNETIC
MANUFACTURING CO.**

685 S. 28th Street, Milwaukee 15, Wisconsin

mine at Ramsay, Michigan, has been made superintendent of the St. James.

At Hibbing, Minnesota, the big 1150 B. dragline and conveyor which have been stripping at the Morton mine of the M. A. Hanna Company have been closed down for the winter, but will resume work in the spring. About 35,000,000 cubic yards of surface are to be moved so that mining of taconite can begin. The drag, which has a maximum digging capacity of 2,000 cubic yards per hour, had been taking 60-foot cuts in an east-west direction; the ratio of cubic yards of stripping to tons of ore may be the highest ever undertaken on the Mesabi range. The Morton operations necessitated the moving of a community church, replacing the Morton school, relocating an old township road, and water, telephone and lighting facilities.

This year the Snyder Mining Company will operate on four 40-acre sections which include the old Whiteside underground mine (idle since 1915) at Buhl, Minnesota. Two of the forties are owned by Snyder and two were purchased from the Oliver Iron Mining Company.

The Cleveland Cliffs Iron Company, which is doing diamond drilling at the eastern side of Ishpeming, Michigan, plans to drill through the Negaunee formation in the area if possible. To do this may require holes of 4,000 feet or more in depth.

The Inter-State Iron Company has been active on several fronts lately. It has made a contract with the Pacific Isle Mining Company to mine for it the north half of the Missabe Mountain mine at Virginia, Minnesota. As the property adjoins Inter-State's Columbia mine and the slope of ore on the property line on the Missabe side is high and steep, the arrangement is mutually advantageous since it gives the Columbia more room in which to operate and solves a difficult mining problem for Pacific Isle. At Inter-State's Hill-Annex mine, Calumet, two new screening plants are being built. One is to handle ore from the north extension area now being stripped. The screened ore from this plant will be carried by a cross conveyor to the main belt from the pit. The second plant is north and east from the present loading pocket and is to screen ore from the Sullivan mine stockpile and from the old Hill-Annex lean ore piles which have accumulated during the long years of operation. The piles contain material which could not be treated in the straight washing plant which served the mine entirely until the HMS plant was put in use this season. At Inter-State's Grant mine at Buhl a plant to treat the tailing pond material is to be constructed this winter; an area will be prepared to hold tailing; and the company will do some stripping, road building, stock-piling and exploration.

precipitates—ROCKY MOUNTAIN

Minerals Engineering to Speed Uranium Output

Minerals Engineering Company has entered into a contract with Consolidated Uranium Mines, Inc. to undertake drilling and mechanized mining operations in the Temple Mountain mining district near Greenriver, Utah.

Under the terms of the agreement announced by George Frawley of Consolidated Uranium, operation of the 30 Consolidated claims will be started immediately by Minerals Engineering. First operations using Diesel-driven loaders and other mechanized equipment will start on the large deposit of uranium ore recently developed by Consolidated. Production of 100 tons of ore per day is scheduled. The ore will all be shipped to the new Climax Uranium processing plant at Grand Junction, Colorado, for processing. Blair Burwell is general manager of Climax Uranium Company, and R. G. Sullivan is general manager of Minerals Engineering Company.

COLORADO

John Major and Bob Sedlmyer of Silverton, Colorado, are reopening the *Ricker Tunnel* on Sultan Mountain under contract. Some lead-zinc-silver ore has been found and work will be continued.

The *Climax Molybdenum Company* has entered into a contract with the Federal Government which requires Climax to operate its Climax mine and mill at maximum capacity for a period of five years. Previous maximum production, tonnage-wise, with existing facilities, occurred in 1943 when over 6,000,000 tons of ore was mined and milled. On December 1, 1950, the company announced an immediate increase in the selling price of its regular products by ten cents per pound. Molybdenite concentrates f.o.b. Climax, Colorado, are now quoted at \$1.00 per pound of contained molybdenum plus the cost of containers. William J. Coulter, vice president in charge of mining, will direct the stepped-up scale of operations.

Harrison Cobb of Boulder is making regular shipments of gold ore from the *Franklin* mine in the Wallstreet district, Boulder County, Colo-

rado, to the *Front Range Mines, Inc.*'s mill at Dumont.

The *Highland Mary Mines, Inc.*, Silverton, San Juan County, Colorado, is mining and milling 70 tons of gold-silver-lead ore per day. Twenty men are employed, with Fred Brinker as manager. All ore is coming from shrinkage stopes, with an average width of six feet, above the No. 3 level. Ore is transferred to the Bradley level through an ore pass and trammed to the crushing plant at the Bradley portal by five-ton battery locomotives and two-ton side dump cars.

Moffitt and Barbour have started operations at the Little Daisy mine on Mineral Hill in the Breckenridge district of Colorado.

C. J. Van Buskirk has been developing the *Hoosier Boy* mine on Henson Creek 16 miles southwest of Lake City. A 30-inch vein, believed to be the extension of the Ophir vein, is being developed.

The *United States Vanadium Corporation* is operating its Uravan, Colorado, uranium-vanadium plant at capacity following the complete rebuilding of the mill during 1950. The corporation's mines and lessee-operated properties in Montrose, Mesa, and San Miguel Counties also

are operating at full capacity to supply ore for the Uravan plant. J. E. Hopkins, Jr., is superintendent at Uravan and E. M. Paris is superintendent of mines.

SOUTH DAKOTA

A postwar operating record was set in the third quarter of 1950 by the *Homestake Mining Company* at Lead, South Dakota. During the quarter 329,794 tons of gold ore valued at \$5,038,701 was mined and the total tonnage mined in the first nine months of the year was 960,794 tons valued at \$14,456,692 compared with production valued at \$15,683,159 during the entire year of 1949. Guy N. Bjorge is general manager of Homestake.

UTAH

The Atomic Energy Commission has completed four surface diamond



KENNECOTT CHURN DRILLS AT UTAH MINE

Pictured above is an electrically-driven churn drill on the "F" prime level (6,740 foot elevation) of the openpit copper mine at Bingham Canyon, Utah, of the Utah Copper Division, Kennecott Copper Corporation. The drill, on the south rim of the 878-acre openpit mine, is used for deep drilling to determine the extent and grade of mineralization along the south edge of the orebody. With a current daily production of 90,000 tons of low grade copper ore, this famous openpit mine is the largest single source of copper in the United States.

Complete plants for crushing ores and non-metallics



Crushing plant at Portland, Colorado, reducing
limerock and shale to $\frac{3}{4}$ " size, 300 tons per hour.

- Every function of the completed plant must be engineered with the whole operation in view. Advantage in one department must not create problems elsewhere.
- Stearns-Roger offers COMPLETE service, engineering, design, manufacture, and field construction. Whether you plan an entire new plant or modernizing or enlarging existing structures, you will be well repaid for using the complete facilities of Stearns-Roger.

One Responsibility—
for

- ENGINEERING
- DESIGN
- MANUFACTURE
- CONSTRUCTION

Stearns-Roger

THE STEARNS-ROGER MFG. CO. DENVER, COLORADO

drill holes in the Marysville uranium district of Utah. Two drill rigs have been drilling on the *Buddy* claim following initial drilling on the *Farmer John* claims. Diamond drilling by the Commission on the Marysville claims of the *Bullion Monarch Mining Company* is reported to have revealed ore in at least two veins in one hole drilled to a depth of 400 feet at a 45° angle. This hole was collared about 100 feet west of Bullion Monarch's east end line. Bullion is advancing its adit southeasterly to cut one of the veins located by drilling.

Plumbic Mines Company has sunk the *Jeepster* incline 400 feet at Marysville, Utah, and is crosscutting northerly from the bottom. Most of the work in the past has been in igneous extrusives, but recent work has been in a quartz monzonite, the uranium host rock of the district. J. G. Sargent of Salt Lake City is directing this work.

The *Vanadium Corporation of America* is continuing an active development program at three uranium mines in the Marysville district. D. W. Viles, vice president in charge of mining, Durango, Colorado, is directing the work. W. Withmeyer is in charge at Marysville. The *Prospector* mine has been developed to a depth of 200 feet, *Freedom No. 1* to 77 feet, and *Freedom No. 2* to 60 feet. Two veins have been found at the *Freedom No. 2* mine. Crosscutting from the *Freedom No. 1* mine is being pushed northerly to drive under the *No. 2*, where two shifts are working now that ventilation has been improved by completion of a churn drill hole.

The Colorado Exploration Branch of the New York Raw Materials Operations, U. S. Atomic Energy Commission opened sealed bids in Grand Junction, Colorado, on December 26th for diamond drilling in the Blanding district, San Juan County, Utah.

Jack Tappan of Green River, Utah, is mining uranium-vanadium ore in Wayne County and trucking it to the AEC ore buying depot at Monticello.

Filtrol Corporation's new \$3,000,000 Salt Lake City, Utah, plant to process locally-mined clay will open in January, 1951, according to Myron A. Bantrell, board chairman.

Howell Mining Company, as operator for a joint exploration program with *Canadian Radium and Uranium Corporation* of New York City, has been trenching on the *Yellow Canarie* claims in the Marysville district, Utah. Earl Havenor of Salt Lake City is manager for Howell.

Control of *Magnolia Lead Company* has been purchased by Kenneth C. Griffith of Salt Lake City and C. W. Anderson of Manti from Austin B. Smith of Salt Lake City. Griffith and Anderson also hold leases on the *McIntosh-Henry* claims in the Marysville district, Utah.

MINING WORLD

precipitates—NORTHWEST

Metaline Mining & Leasing Co. Reports Uranium Find

An unidentified, brownish-yellow, secondary uranium mineral has been found in the zinc orebodies at the Bella May mine of the Metaline Mining and Leasing Company, Metaline Falls, Washington. The discovery was made by Ernest Thurlow, geologist for the Atomic Energy Commission. Company engineers had long known of the existence of a mineral which formed thin sheets and film coatings on the ore, but had believed it to be a cadmium mineral. Further geologic work in the district has shown that some faults carry radioactive minerals as well as several of the shale partings in the Cambrian Metaline limestone and the overlying Belknap shale. Quite probably the radioactive shale partings can be used as a "marker bed" in the district to aid in geologic mapping and studies.

The uranium discovery is reported to be the first example of syngenetic uranium minerals in limestone. To date, however, the secondary mineral is the only one identified megascopically.

James L. Leonard of 801 Realty Building, Spokane, Washington, is president of Metaline Mining and Leasing.

North Butte Reopening; Plans 5 Million Lb. Output

The North Butte Mining Company has received a \$390,000 mining loan from the Reconstruction Finance Corporation to expand copper output at its North Butte properties, in Butte, Montana. Construction work is beginning at the company's Granite Mountain mine.

The project is scheduled to recover 5,000,000 pounds of copper annually at an estimated cost of less than 12 cents per pound. In order to produce this amount of copper one of the largest deliberate leaching programs ever conducted will be inaugurated and carried out. Joseph E. Parker of Butte, Montana, is president of the North Butte company.

Yellow Pine Recovers Scheelite in Tailing

Bradley Mining Company, which produced approximately 40 percent of the United States' domestic tungsten during World War II, is producing scheelite concentrates again at Stibnite, Idaho.

Although the known high grade scheelite orebody at the Yellow Pine

mine was exhausted at the end of World War II, Bradley has been running metallurgical tests for a number of months and recently concluded that by gravitational methods the lower grade disseminated scheelite occurrences throughout most of the antimony ore can be successfully recovered. Plans are now being made for a Humphrey Spiral installation to recover the scheelite from the discharge of the 9½ by 12 foot Marcy rod mill.

During the interim a substantial tungsten recovery is being made by the old procedure of flotation of scheelite from the concentrator tails followed by tabling—the end result being production of both a high grade and a low grade tungsten concentrate. In addition, owing to the critical shortage of tungsten, exploration for higher grade orebodies is being pursued strenuously.

Day Mines to Drive Long Tunnel to Fern Group

Day Mines, Inc., under terms of a recent agreement with Coeur d'Alene Mines Corporation, has obtained a long-term easement on the Rainbow tunnel, will reopen the tunnel and extend it a long distance to the south

for the purpose of exploring its large Fern group of more than 80 unpatented claims in the Coeur d'Alene silver belt of Idaho. The project is expected to take several years.

Day mines is now bulldozing an access road from the old Vulcan tunnel dump to the caved portal of the Rainbow tunnel. The long extension to the tunnel will be driven from Rainbow holdings, across the Triangle group and Sterling Mining Company holdings, into the Fern property, in the southeasterly corner of the Silver Belt.

The company, now producing from the Sherman, Tamarack, Dayrock, Monitor, and Hercules properties, increased production in the third quarter of 1950 and increased profits even more as a result of higher base metal prices.



The new 200-ton per day differential flotation mill being built by the Western Machinery Company for the Triumph Mining Company, Hailey, Idaho, is 80 percent completed and should be finished in January.



LEAD-SILVER GOES TO IDAHO SMELTER

A Whitelief Mining and Development Company truck dumps eight tons of lead-silver concentrates at Bunker Hill and Sullivan's smelter, Kellogg, Idaho. As all receiving orebins were full, the concentrates had to be dumped on the platform. Regular shipments of concentrates from leasing operations above the 400 level of the Clark Fork, Idaho, mine are being made. Whitelief recently installed a new compressor and motor at the mine and is starting a shaft-deepening program to reach and mine indicated ore in lower levels of the property.



**ONLY ONE FIRM TAKES
FULL RESPONSIBILITY
FOR COMPLETE MINE
CONVEYOR PERFORMANCE**

**... only Hewitt-Robins
makes and guarantees
both machinery and belt**

No longer need you worry about your Mine Conveyor operation—wondering who will be responsible for the successful, *lasting* performance of its machinery *and belt*.

Get your Mine Conveyor from Hewitt-Robins. Here is a company—the only company in all the world—able *and willing* to take complete *unified* responsibility for the installation. For only Hewitt-Robins makes both machinery *and belt*.

The machinery is the sturdy, strong, substantial construction made by the Robins Conveyors Division and installed in all the better mines. The belt is the famous Ajax® Underground Belt—with mildew inhibitors and acid neutralizers compounded in its wear-resisting rubber covers and high tensile fabrics in its enduring carcass—made by the Hewitt Rubber Division.

Yes, when you buy a Hewitt-

Robins Mine Conveyor you get not only the best elements—machinery and belt—that your money can buy; you also get the satisfaction and peace of mind that come from having one unified source guaranteeing successful performance.

Hewitt-Robins Mine Conveyors can be shipped complete—machinery, belt, motors, reducers and drives—out of stock from Passaic, N. J., and Charleston, W. Va., in belt widths 26", 30" and 36", any desired length. For immediate delivery, get in touch with Hewitt-Robins Incorporated, 1010 Pennsylvania Avenue, Charleston, W. Va., or 270 Passaic Avenue, Passaic, N. J.

**HEWITT-ROBINS
MINE CONVEYORS**

HEWITT-ROBINS  INCORPORATED

Belt Conveyors (belting and machinery) • Belt and Bucket Elevators

Car Shakeouts • Dewaterizers • Feeders • Foam Rubber Products

Foundry Shakeouts • Industrial Hose • Mine Conveyors • Molded Rubber Goods

Ruberlokt Rotary Wire Brushes • Screen Cloth • Skip Hoists • Stackers

Transmission Belting • Vibrating Conveyors, Feeders and Screens

All concrete foundations for the mill and crushing plant have been poured. 75 percent of the structural steel has been erected, and the new 24 by 36 inch Traylor primary jaw crusher and other equipment has been installed. Steve Mitchell of San Francisco is in charge of a 45-man crew.

Western Mines, Inc., of Seattle is now developing the Ophir, Emma and adjacent claims near Rocky Bar, Idaho, according to Charles Martin, owner of the Ophir and half owner of the Emma. Gene Jack, president of Western, is pushing development, including the construction of a mill on the Ophir property.

Near Clark Fork, Idaho, A. M. and W. W. Derr have acquired the old Scotchman mine on Blue Creek under a lease and option to buy and will resume production of zinc-lead-silver-gold ore. The road to the property has been rebuilt.

Baumhoff-Fischer Company, during a recent test run of its 11 cu. ft. connected bucket-line dredge on Big Creek, Valley County, Idaho, recovered 60 tons of ilmenite-bearing concentrates in 24 hours. The ratio of ilmenite and other heavy minerals to the gravel is estimated to be one part to one hundred. Erection of a processing plant at Boise to treat the concentrates is reportedly under consideration.

One of Signal Mining Company's Pine Creek, Idaho, lead-zinc mines will start producing soon, according to Robert E. Brown, president, Kellogg. The property is on Denver Creek near the Nabob and Sidney mines. Ore will be milled in a nearby custom mill, and about 5,000 tons of ore have been developed for mining.

Bliss Moore, vice president and general manager of Sunset Minerals, Inc., operator of the Liberal King mine on Pine Creek, Idaho, has announced that the Liberal King shaft will be sunk below the 2100 level. The plan is to sink a winze on the main vein, then drift and raise to connect with the main shaft. Production at the mine is being maintained at present at 100 tons per day, in spite of a high labor turnover.

MONTANA

Morning Glory Mines recently made its first shipment of concentrates from its new 125-ton flotation mill near Silvanite, Lincoln County, Montana, to AS&R's smelter at East Helena. Mill assays show that chief values are gold, silver, lead, and copper. All ore was mined from the No. 4 level where three to five years of reserves are reported to be blocked out. A three-compartment shaft extends from the No. 4 to the No. 12 level, eventually to be the main haulage level. Ore showings have

MINING WORLD

been found on the Nos. 2, 4, 6, and 8 levels, according to W. Bruce Peck of Spokane, director. Recently a gravelled road was completed to the property.

Some recent visitors reported in the Boulder, Montana, uranium district included Millar Reyner, geologist of the Atomic Energy Commission; Raymond F. Robinson, chief geologist of Sunshine Mining Company; crews of the United States Geological Survey; and representatives of the Newmont Mining Corporation. The latter is said to have optioned and made operational contracts with owners of uranium holdings near Alhambra, Jefferson County. The properties are reported to include the Haines homestead and Wayne Hinman's claims.

At Superior, Montana, Nancy Lee Mines, Inc., reports that the old 1,700-foot crosscut tunnel at the King and Queen mine has been rehabilitated and work has started on a 400-foot crosscut which will be driven to get under an orebody mined above. The company also has rehabilitated its camp. A total of 16 men are employed on a three-shift basis.

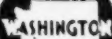
Continental Drilling Company of Los Angeles, under contract to the U. S. Bureau of Mines, is diamond-drilling for manganese at Philipsburg, Montana. The project is a cooperative effort between the Bureau of Mines and the U. S. Geological Survey, with Robert N. Roby, mining engineer, Bureau of Mines, supervising the drilling, and Ralph Thurston, geologist, Geological Survey, designating the targets. The purpose of the project is to develop manganese reserves in the Silver Hill Formation underlying the heretofore productive Hasmark Formation. Continental Drilling is using a Model JS Christensen diamond-drill rig and double tube ball-bearing core barrels. All holes are started NX (3-inch) size and finished at BX (2 $\frac{3}{8}$ -inch) size.



Plans to work the old Givens and Nichols channel placer near Bridgeport, Oregon, at a rate of 1,000 tons per day for both gold and platinum values have been reported. Present owners of the property are G. I. Wild and Earl A. Pack. Although gold has been mined from the property for many years, the discovery of platinum was made by Pack only very recently.

The Continental Chemical Company at Salem, Oregon, reports it will pay \$0.45 cents per long ton f.o.b. for 25 percent manganese. For ore as low as 20 percent Mn, two cents per unit less will be paid. Samples should be sent to the company before shipment is made.

JANUARY, 1951



A 40-ton mill will soon be installed at the Jim Creek mine, a new lead producer about six miles northeast of Ione, Washington. George and Henry Rushmier, prospectors, have been stockpiling ore at the mine for about two years. Their partner, Val Y. Preston, says that since July about \$10,000 worth of equipment including an ore bin, chute, air hoist, compressors, track and ore cars, have been acquired. Camp buildings have been erected. A shaft, sunk from a 12 by 15 foot pit, has reached a depth of about 60 feet at a 45° angle. Values are mainly lead with some silver and zinc showing. On December 2nd the mine was incorporated at Olympia as the Jim Creek Mines, Inc., with a capitalization of \$180,000.

The Gold Bond Mining Company at Blewett, Washington, is planning to install a two-unit, 500-ton capacity mill, according to recent reports. Company officials are said to be studying various makes of mills to determine the best for Gold Bond ore. Frank Lilly, president, has reported also that the 2,700-foot aerial tramway from the upper tunnel of the Olympian mine to the Suckling mill has been completed. Bins are being built at the mine and the mill. Other plans of the company include the possible increase of the Avon mill's capacity to process free-milling gold ores and a development program in the Pole Pick mine. The Gold Bond ores carry values in gold and silver in the Pole Pick veins, silver and copper in the Peshastin veins, and nickel and cobalt in the Gold Quartz veins.

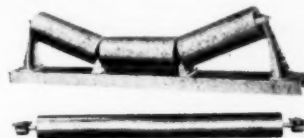
A winze will be sunk to the seventh level of the Kaaba Silver-Lead Mine at Nighthawk, Washington, according to Lee B. Carroll, manager. The company's mine and mill are operating on a three-shift basis and additional ore is needed to keep the sink-float plant operating at capacity.

Prospecting over 5,753 scattered acres held under lease northwest of Metaline Falls and northeast of Leadpoint, Washington, is planned by Grandview Mines, Inc., of Metaline Falls. Recent study of geology and known ore occurrences of the area by three engineers has indicated the desirability of exploration, according to Karl W. Jasper, Grandview president. Plans are not complete in detail, but 20 percent of net income from shared mining profits is earmarked for acquisition, exploration, and preliminary development of new ground. Dividends will continue to be paid, according to a recent letter mailed to stockholders, who were told that approximately \$25,000 is allocated presently for purchase of mineral rights.

THE RIGHT IDLER

RIGHT FROM STOCK!

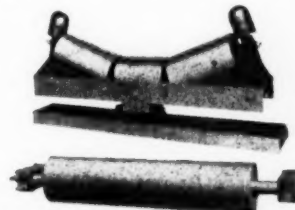
Hewitt-Robins is "Idler Headquarters" for the materials handling industry. You can get just what you need, when you need it, from our Passaic plant or our strategically located warehouses throughout the country. Remember—only Hewitt-Robins Idlers give you One-Shot Lubrication, Patented Triple Grease Seal and Rigid Truss Construction!



TROUGHING IDLERS & RETURN IDLERS—The most dependable general-purpose, heavy-duty idlers made. Pulleys 4" (ball bearing), 5" and 6" diameter (roller bearing), 14" to 60" wide.



RUBBERDISC CUSHION IDLERS—Absorb shock at loading points, save the belt. 4" and 6" diameter pulleys, widths 24" to 60". Rubberdisc Return Idlers keep sticky materials from "building up" between belt and idler. 5 $\frac{1}{2}$ " discs, 16" to 60" widths.



TRAINING TROUGHING & RETURN IDLERS—Not just "guide idlers", but genuine trainers that keep the belt running true. One about every 50 feet, with a Return Trainer in place of every 6th or 8th regular Return Idler, will improve conveyor efficiency and lengthen belt life. Troughing Trainers available with ball or roller bearing pulleys, 4" and 5" in diameter; widths 16" to 48". Return Trainers, with 6" diameter pulleys, 14" to 60" wide.

HOW TO SELECT THE RIGHT IDLER—Bulletin 120-A1 tells the whole story of Hewitt-Robins Idlers; gives you a precise "formula" for selecting the best type for your particular needs. Write for it. Robins Conveyors Division, Hewitt-Robins Incorporated, Passaic, N. J.

HEWITT-ROBINS

IDLERS

precipitates — SOUTHWEST

Will This Small Mine Become a Real Producer?

The Gladiator mine at Crown King, Arizona, produces lead, zinc, gold and silver, and a small amount of copper. The mine is now owned by the heirs of E. M. Moores and R. F. MaGuire and is under lease and option to C. F. Moores and Fred G. Holmes, operating under the name H. & M. Mining Company.

First patented in 1878, the mine produced about 50,000 tons which was milled in a stamp mill on the property. E. M. Moores and R. F. MaGuire bought the property in 1936 on a royalty basis, and C. F. Moores operated it until the beginning of the war, after which A. N. Bennett became operator. During C. F. Moores' operation, 25,000 tons of ore was mined with a gold and silver value of \$20.00 per ton. No payment for lead or zinc was made, as the ore was not milled but shipped to a copper smelter.

During the war a 50-ton flotation mill at Cleator, Arizona, was acquired and a satisfactory recovery of zinc, lead and gold concentrate was made. In 1948 the mine was

closed because of rising costs and labor conditions. Recently, however, with the increase in metal prices and the possibility of Government aid, the mine was reopened and the first trial run made at the mill.

C. F. Moores says there is considerable ore in sight, and near the surface lie several thousand feet of vein from which good shipping ore has been produced in the past, but which has not been developed in depth. Dewatering of an old 300-foot winze below the adit level has revealed substantial orebodies.

At present mining is being held to a minimum because of lack of operating capital. Also, all hauling to the mill is suspended during the three most severe winter months because of the 7,000-foot elevation of the mine.

The Gladiator provides a good example of a small U. S. mine and its problems. Since 1936 when Moores and MaGuire bought it, about \$750,000 worth of ore has been produced. If, as Moores hopes, the Government will give aid, the Gladiator could become a substantial producer of strategic metals.

Copper Cities Starting Big Openpit Project

The Copper Cities Mining Company, a wholly-owned subsidiary of the Miami Copper Company, recently completed negotiations for a loan from the R. F. C. The loan is to be used in developing and bringing into production a copper property of the Copper Cities Mining Company in the Globe-Miami mining district, Gila County, Arizona. The present plan contemplates the use of the Castle Dome concentrator and mining equipment, which will be moved to and erected at the new site.

The deposit, which is comparable in size and grade to the Castle Dome mine, will be developed as an open-pit mine. Preparatory work on the project is scheduled to start immediately. The productive capacity of the new property will be approximately 12,000 tons of ore per day, or 45,000,000 pounds of copper per year. R. W. Hughes, general manager of Miami Copper, made the announcement.

Phelps Dodge May Develop New Openpit Mine

The Phelps Dodge Corporation, Arizona's biggest copper producer, may develop a large low-grade copper property, known as the Bisbee east orebody, at Bisbee, Arizona. The mine would be worked by open-pit methods.

A drilling program is under way to prove present favorable indications that the operation could be undertaken. Development would be started in 1951 and would cost between \$25,000,000 and \$30,000,000. The company has made no statements yet as to when production could start or what its rate would be. However, initially stripping of waste to a depth of as much as 350 feet to uncover the orebody would be necessary, as would be acquisition of drilling equipment, electric shovels and haulage equipment, installation and equipment of a concentrator, and other related facilities.

New Mexico Potash Mining Is Still Expanding

Rumors have been heard all over New Mexico that a sixth firm—the Freeport Sulphur Company—may move into Carlsbad to begin potash production.

Meanwhile, the two shafts being sunk for the Duval Sulphur and Pot-



ACRES AND ACRES OF TEXAS SULPHUR

The Texas and Louisiana Gulf Coast area produces more than 90 percent of the world's supply of sulphur. In Texas, the Texas Gulf Sulphur Company has mines at Newgulf and Moss Bluff. The company uses the Frasch process to mine sulphur and facilities for the process include a 260-acre reservoir with a capacity of 700,000,000 gallons of water, a Cochrane hot process lime-soda softening plant which can treat 30,000 tons of water daily, ten water-tube Sterling boilers of 1,500 hp each, and vats varying from 1,200 to 1,300 feet long, 50 feet high, and 160 to 200 feet wide. The liquid sulphur is poured into the vats, becomes solidified, and up to several million tons is thus naturally stored for future shipment. In the picture a Marion Type 362 shovel with a 1½ cubic yard bucket is being used to load railroad cars at Newgulf.

sh Company are going down six feet daily and by early December the shafts had reached a depth of about 25 feet.

The sinking of two shafts for the Southwest Potash Company, a subsidiary of the American Metal Company, Ltd., began in early December. The firm reportedly expects to be ready to start operations late in 1952 with a proposed first year production of 185,000 tons.

The International Mineral and Chemical Corporation's third shaft was about 725 feet deep the first week of December. A fourth shaft for lowering men and materials and for ventilation probably will be sunk soon, according to reports.

The activity of these companies is lending further credence to the statement that New Mexico is the biggest potash producer in the world.

ARIZONA

A carload of spodumene has been shipped from the *Lucky Mica No. 1* claim, owned by B. H. Fortner and Bert Boyd of Wickenburg, Arizona. The property is located three miles east of the Vulture Peak and 11 miles south of Wickenburg. The initial shipment of 50 tons, made through Philip S. Hoyt of Aguila, went to a chemical concern at Maywood, New Jersey. Lepidolite is a by-product of the mining operations, but so far no market for it has been found. Fortner and Boyd are employing a crew of eight men and expect to be producing from two different places on the property at an early date.

The *Hilltop* lead-zinc mine at Portal, Arizona, has been reopened by *Piedmont Mines, Inc.* Present work is in the upper levels, where a crew of 15 men is employed. A small mill is being installed and the power plant is being revamped. L. K. Diffenderfer is general manager.

Development of the *New Year's Eve* mine, near Tucson, Arizona, has been started by the *S. W. Shattuck Chemical Company*, 1805 South Bannock Street, Denver, Colorado. The property consists of four claims in the Twin Butte mining district of Pima County. The company began development on September 18 and the mill began operating on November 18 at a rate of 15 to 20 tons per eight-hour shift. Main values are in molybdenite; and concentrates are shipped to the company's chemical plant at Denver. The company specializes in molybdenum, uranium and tungsten chemicals and is entering the mining field to be assured of a steady source of raw materials for the plant. J. Seward Potter is president. George

Scholey is mine manager, Tino Saunders is mine foreman, and O. (Red) Harris is mill foreman. A crew of 15 men is employed.



California's small mines are showing increased activity due to the present metals demand. In Mono County, the *Sarita Milling Company* at Bridgeport is said to be planning to increase the present 100-ton mill

capacity and has recently acquired a new power shovel so as to increase mine production. In Inyo County, the *Pinnacle Mining Company* at Independence has taken over Otis A. Kittle's tungsten mine near Bishop and has started operating it. The *Comanche* gold mine at Blind Spring Hill has been reopened. In Plumas County, Francis Schultz of Greenville has sold the *Davis Claim* lease to Messrs. Hilliar & Barnes. Near Quincy, John Rhode is completing extension of the *Gold Lode* mine tunnel and plans to mine through the winter. In the Almanor district of this county *Barium Products, Ltd.*,



Diamond Core drilling on contract is your key to lower operational costs.

Boyles Bros., leaders in the field of Diamond Drilling for over 50 years, are equipped to give you complete service in Exploratory and Blast Hole Drilling or Tunneling operations.

Mining men and contractors will find no job too big or too small for Boyles Bros., leading Diamond Drilling experts.

Full information on request.

Boyles Bros.
DRILLING COMPANY

1321 SOUTH MAIN STREET • DIAL 6-8555 • SALT LAKE CITY

has reopened the *Savervool* barite mine. In San Bernardino County, *Mineral Materials Company*, which owns the *Starbrite* mine north of Barstow plans to sink several 100-foot test shafts to determine the length and continuity of a tungsten vein from which 50 tons of ore per day are being mined now by openpit methods. In Sierra County the *Security Gold Mining Company* is said to be planning installation of a concentrator at the *Big Boulder* gold mine below Gold Valley. The company is placer mining now, but will start openpit work with a bulldozer soon on some of the 500 acres comprising the claims. In Calaveras County the *Flintkote Company* has begun mining asbestos from the *Voorheis* deposit in the Copperopolis

area. In Mariposa County R. H. Jackson will add a concentrating unit to his mill at the *Early* gold mine near Mariposa. Near Hornitos, mill installation is under way at the *Domingo* gold mine.



A report has been received about the *Red Bird* property near Searchlight, Nevada, in the early days known as the *Black Hawk* mine. About 18 months ago the property was acquired by a T. Nabb who, having discovered surface ores were low

grade, did some diamond drilling on the *Red Bird* claim with interesting results. Gold values increased with depth and at 193 feet were said to be exceptional. Later, a drift 300 feet from the portal of the abandoned *Black Hawk* shaft revealed 35 feet of quartz breccia of good grade. At present the operators are stoping on 20 feet of gold ore. According to one mining engineer the operation is an important development so far as the Searchlight area is concerned.

Fred G. Risley, treasurer of the *Gray Eagle Development Company*, Beowawe, Nevada, says the company is doing underground work in the Hovenden tunnel and that the main drift has been cleaned out to the Edwards stope where gold-silver-lead-zinc ore is being mined. The No. 5 drift will be extended along the same vein, making a total of 350 to 400 feet of drift leading to the Hovenden tunnel. Ore is shipped to a Salt Lake valley smelter.

The *Copper Canyon Mining Company* at Battle Mountain, Nevada, is retimbering part of its shaft and rebuilding its crushing plant, both of which were damaged by fire in June. Meanwhile copper ores from the stockpile and surface deposits are being milled on a reduced tonnage basis. When repairs are completed the mill will be able to handle 350 tons of lead, zinc, and silver ores per day. The company employs 25 men: Robert H. Raring is manager and Ralph Hayden is mill superintendent.

Getchell Mine, Inc., is milling about 900 tons of gold ore daily at its mine near Red House, Nevada. During the first six months of 1950 the company milled 153,516 tons for a return of \$689,991. Since then mill capacity has been increased to 1,500 tons, and production figures for the last six months of the year should be a good deal higher.

From 450 to 600 tons of manganese ore is being produced monthly by the *Charleston Hill National Mines Company* at its *Black Diablo* property south of Golconda, Nevada. The company, Nevada's largest producer of manganese, sends its ore to the Geneva, Utah, plant of the *Geneva Steel Company*.

Kennecott Copper Corporation, McGill, Nevada, is producing about 18,000 tons of ore daily from the Ruth open pit and stripping and development began at the new Kimbley open pit, near Lane City, where production is scheduled for two and a half years from now. Isbell Construction Company is doing the stripping.



The Atomic Energy Commission, using the U. S. Geological Survey to

MINING WORLD

PORTOCUT

one man-
balanced

air powered
chain saw



- lightweight
- dependable
- powerful
- handy

mine timbering weight 46 lbs.

pile trimming true cutting

heavy framing 5 cyl. piston motor

THE VULCAN IRON WORKS COMPANY

DENVER 2, COLORADO

IND AIR "SPARKY" SAYS:

NOW! IND-AIR
BRINGS YOU

STOODY PRODUCTS

A complete line of
**HARD FACING
OVERLAYING ALLOYS**

- Cut **DOWN**
operating costs!
- Speed **UP**
production!



INDUSTRIAL AIR PRODUCTS CO.

**IN THE FAR WEST
PORTLAND, ORE.**

3200 N.W. YEON
Phone CApital 1821

SPOKANE, WASH.

E. 4230 TRENT
Phone Lakeview 1595

MEDFORD, ORE.

North on Highway 99
Medford 2-8778

**IN THE MIDDLE SOUTH
NEW ORLEANS, LA.**

3420 WASHINGTON AVE.
Tyler 2301

PASCAGOULA, MISS.

COLUMBUS DRIVE
Pascagoula 1521

explore for uranium sources in low-grade ores, has reported favorably on the samarskite deposits in Rio Arriba County, the granite in Mora County, the phosphates near Tyrone, and the black shale oil in southern New Mexico. The increase in demand has made these uranium sources become worthy of further investigation.

The Illinois Zinc Company's subsidiary, the Peru Mining Company, has stepped up mining operations at its Grant Co., New Mexico, properties, according to reports. Also a major exploration program is under way to provide additional reserves—if possible—for the future. The need for zinc for the parent company's rolling mill requirements and for the Government's stockpiling program have been the stimulus for greater production.

The New Mexico Bureau of Mines and Mineral Resources is making a geologic examination of the Socorro perlite deposit of the Great Lakes Carbon Corporation. The Bureau is preparing a geologic map of the deposit from data obtained in the field under the supervision of Eugene Callaghan, director.

The Royal John mine, 30 miles east of Silver City, New Mexico, has reopened and is producing about 30 tons of lead-zinc ore daily. In the Magdalena area, zinc-lead production is under way again at the Nitt mine operated by John McDonald; at the North Juanita mine of George Tafoya; at the Kelly mine of J. D. Torres; and at the Lynchburg mine of Carl Elayer. The Lynchburg produced copper ore during the early part of last year.

The Great Western Mining Company is installing a modern pegmatite treatment plant at Mora, New Mexico, designed to recover from 60 to 80 tons of scrap mica per day. All equipment for the plant has been delivered and a construction crew of 12 men is erecting it. Mining of the mica-bearing pegmatite will be done by openpit methods and drilling with Sullivan heavy-duty wagon drills has been under way for some time. The scrap mica will be trucked to Las Vegas for rail shipment to all parts of the U. S. Rufus C. Little of Las Vegas is president and general manager of the company.

Large tonnages of low-grade scheelite have been developed by Donald S. Tedford on his tungsten claims in the Victoria mining district some 20 miles west of Deming, New Mexico.

William H. Goodrich, general manager of the Kennecott Copper Corporation's Chino Division, reports that open-pit production of low-grade ore now is being conducted on a round-the-clock schedule. He also says the firm's Hurley leaching plant is precipitating copper with 50 to 60 carloads of tin cans shipped to Hurley from the West Coast.

A \$300,000 bond issue has been authorized for a building program at New Mexico School of Mines. A student union building, a State Bureau of Mines building, a golf course and a clubhouse are planned.

DON'T PASS UP STRATEGIC MINERALS!

Uranium • Scheelite • Mercury
Zinc • Zirconium •
Thallium •



MINERALIGHT Model SL

- | | |
|---------------------|---|
| POWERFUL: | Effective to 30 ft. on many minerals. |
| COMPLETE: | No parts to change. |
| SIMPLE: | Operates with touch of finger. |
| LIGHTWEIGHT: | Easy to carry in field. |
| FLEXIBLE: | Use on any size specimens. |
| VIEW BOX: | Built into field case. |
| LOW COST: | Lab. models from \$12.50. Field models from \$34.50. |

Send for copy of folder MW describing uses of MINERALIGHT in mining. See your dealer today.

ULTRA-VIOLET PRODUCTS, Inc.
South Pasadena, California

Kleenslot

WEDGE-WIRE
PREPARATION
SCREENS

THE *Right* **KIND**
for **DEWATERING**
SIZING and
SCREENING **TYPE**
SIZE

SEND THIS COUPON
TODAY!

WEDGE WIRE CORP.
5602 Clark Ave., Cleveland 2, Ohio

Gentlemen:
Please send us literature outlining the superiority of Wedge Wire construction.

COMPANY _____

NAME _____

ADDRESS _____

Wedge-Wire

CORPORATION

5602 CLARK AVE. CLEVELAND 2, OHIO

NEW METHODS—NEW EQUIPMENT

Caterpillar Builds New Plant at Joliet, Ill.

First steel erection at the new Caterpillar Tractor Co. plant at Joliet, Illinois, has started according to T. R. Farley, Vice-President. The new plant at Joliet marks an additional expansion of manufacturing facilities with which it is planned to achieve the greatest possible economy in the manufacture and distribution of Caterpillar products.

It is planned that final assembly operations from component parts produced by Caterpillar and the present subcontractors, will start in the Joliet plant even before the building is completed and the necessary machinery for fabrication is installed. The Joliet site is suited ideally for the manufacture, assembly and shipping of earth-moving equipment.

Castings Resist Abrasion, Corrosion and Heat

Hard-metal castings of Stoodly alloys are now available in sizes from one-half inch I.D. (in lengths up to 2 inches) to 10 inches O.D. (in lengths up to 30 inches). To produce these hard-metal parts, the Stoodly Company, Whittier, California, recently installed equipment for centrifugal casting under very high pressure and for rapid quenching of the cast parts. Photomicrographs in a new 18-page booklet show a very fine, uniform, dense grain structure which yields, according to Stoodly, parts which often "outlast the finest alloy steels by 10 times or more."

Cast from various Stoodly alloys, including Stoodly 6, an extremely hard cobalt-chromium-tungsten alloy, the finished parts are available in shapes which can be machined from cylindrical castings. Suggested

uses for the castings include bushings, bearing liners, ball-valve seats, die-casting cylinders, steel-mill guide rollers, and other parts subjected primarily to abrasion, corrosion, or heat. Smelter, mill, mine, and steel-mill operators can get an informative 18-page booklet on the new field of hard-metal castings by writing to MINING WORLD for "Stoodly Castings."

Simple "Bit Kicker" Speeds Bit Changes

Recent time studies have shown that bit changing is especially costly in drifts, stopes, or raises where each miner operates his own drill. A new, simple, one-piece tool which allows miners to change single-use bits in a hurry, the Pacific "Bit Kicker" fits any section of drill steel from 7/8-inch hexagonal through 1 1/4-inch round.



Bits are removed in these three simple steps: (1) Place Bit Kicker on drill steel with striking end against skirt of bit. (2) Step on Bit Kicker to force end into contact with skirt. (3) Deliver blow with sledge hammer; only one or two blows are required.

Manufactured by Alloy Steel & Metals Co., 1862 East 55th Street, Los Angeles, California, and priced at only \$6.40 F.O.B., Los Angeles, the

Bit Kicker pays for itself after a saving of only four man-hours of time.

Hydraulic Diamond Drill Features Robot Pilot

The Harinck Hydraulic Diamond Drill is now available from Hydraulic Products, Inc., Detroit, Michigan. The heart of this new diamond drill is a robot pilot known as the "Hydraulic Brain," which limits the spindle stroke at the extension of its travel and which automatically regulates drilling oil pressure in accordance with the hardness of rock being drilled.

Quickly dissembled into six units, the Harinck can be transported by plane and then reassembled in approximately 1 1/2 hours. The 2400-lb. unit powered by a 64-hp. Chrysler gasoline engine and the "Hydraulic Brain" are completely described in a new four-page two-color bulletin, "Harinck Hydraulic Diamond Drill," now available from MINING WORLD.

Hewitt-Robins Chicago Offices Consolidated

Chicago locations of Hewitt-Robins Inc. have been consolidated at 402 West Randolph Street, L. D. Bigelow, vice-president in charge of central division operations, has announced. Offices and warehouses of the Hewitt Rubber, Robins Conveyors and Robins Engineers Divisions will be located at the new address, effective October 30.

The enlarged warehouse space permits greater on-hand stocks of hose, belting and other industrial rubber products. In addition, stocks of conveying and vibrating machinery items will be close at hand, thereby offering better service for the mid-west market.



FEEDOWEIGHT

A self-contained conveyor feeder scale that feeds, weighs, totalizes and registers. Use the Feedoweight for better control of ball mill grinding. It accurately controls FEED by WEIGHT, automatically. Made in sizes to meet all tonnage requirements.

MERRICK SCALE MFG. CO.

PASSAIC

172 Summer Street

NEW JERSEY

CHANGE OF ADDRESS

CIRCULATION DEPARTMENT

MINING WORLD with which is combined the Mining Journal
121 Second St., San Francisco 5, Calif.

Please change the address of my Mining World subscription.

NAME _____

OLD ADDRESS _____

NEW TITLE OR POSITION _____

NEW ADDRESS _____

NEW COMPANY CONNECTION _____

PROFESSIONAL DIRECTORY

One-Inch Card. \$35 Yearly—1/2-Inch. \$20 Yearly. Payable in Advance.

Consulting Engineers:

GLENVILLE A. COLLINS

Mining Engineer
Uranium Exploration
210 La Arcada Bldg.
SANTA BARBARA, CALIFORNIA

THEODORE A. DODGE

Consulting Mining Geologist

403 North Third Ave., Tucson, Arizona
Apartado 130, Hermosillo, Sonora, Mexico

R. L. GILMORE, E. M.

AND ASSOCIATES — ENGINEERS

Mining—Petroleum—Chemical—Metallurgical
Geological Examinations and Reports
Mine Examinations—Mine Management and
Operation—Ore Analysis

GEOPHYSICAL EXPLORATION

6061 State St. Huntington Park, Calif.

HAMMOND-EVERLY ENGINEERING CO.

CONSULTING MINING AND
GEOLOGICAL ENGINEERS

Plant Design MINE Examinations
Reports MANAGEMENT Surveys

27 West Granite Street • Butte, Mont.

HERBERT BANKS JOHNSON CONSULTANT

Electrostatic Separation
Process Developments

26 Forbes St. Rochester 11, N. Y.

Consulting Service

J. BRYANT KASEY

Box 968 • Phone 3-0625 • Bakersfield, Calif.
Mining, Milling, Smelting, Refining
Technical Advice to Management
Chemical Problems

MARK LINTZ

Mining and Metallurgical Engineer

Original sampling thru plant and operations.
Correctly integrated functional units
in plant design. Metallurgical, Non-Metal-
lics and special process problems.

319 Grant Avenue • San Francisco, Calif.

G. G. McDANIEL

Mineral Surveyor (U. S.) Reg'd Civil Eng'r
255 California St. Phone: SU 1-8207
San Francisco, California

STANLEY M. MOOS

MACHINERY CONSULTANT

El Paso, Texas—P. O. Box 321
100 Texas St. Tel. 2-6538
CABLE ADDRESS "MOOS"
Mexico, D. F. Apartado 215

CLAYTON T. McNEIL, E. M.
Mine Examination, Reports, Supervision,
Operation
822 Bank of America Bldg. Tel. GARfield 1-2948
SAN FRANCISCO 4, CALIFORNIA

ARNOLD H. MILLER

CONSULTING ENGINEER

General Mine, Mill and Industrial Ap-
praisals, Plant Design, Mechanization.
Cable: "ALMIL" Tel. Cortland 7-0635

120 Broadway New York City 5, N. Y.

MURPHY, F. M.

Consulting Mining Geologist

1201 Maryland Parkway, Las Vegas, Nev.

PAUL F. SCHOLLA

Consulting Mining Engineering
Metal & Industrial Mineral Mining
Examination Management
Development Surface Plants
Foreign & Domestic

1025 Connecticut Avenue, N. W.
Washington 6, D. C.

JOSEPH T. TERRY

Consulting Metallurgist

Flotation and Cyanidation Mill Tests
Ore Sampling and Assaying
Office and Laboratory

1318 So. Ivar Avenue, Rosemead, California
Phone Atlantic 6-5932

SEWELL THOMAS

Consulting Mining Engineer

Plant Layout • Design • Detailing
Mechanization • Mining Methods

2000 S. Acoma St. Denver 3, Colo.

MILL DESIGN AND CONSTRUCTION

Send for Free Bulletin

O. W. WALVOORD CO.

401 High Street • Denver, Colorado

CLYDE H. WILSON

GEOPHYSICAL SURVEYS

Mineral Deposits • Water Supply • Oil Field Structure

WILSON EXPLORATION COMPANY

Los Angeles Salt Lake City
1727 Westerly Terrace Walker Bank Building

LAWRENCE B. WRIGHT

Consulting Mining Geologist

401 - 41st Ave. San Francisco 21, Calif.

Chemists, Samplers, Shipper's Rep's:

ARIZ. TESTING LABORATORIES

CLAUDE E. McLEAN, REGISTERED ASSAYER
Analytical and Consulting Chemists
Box 1888 817 W. Madison St. Phoenix

B. W. DEASON V. E. WORSLEY

BLACK & DEASON

Assayers and Chemists
Ore Shippers Represented at all Smelters
P. O. Box #1898 Salt Lake City, Utah

ORE SAMPLERS & SHIPPERS' AGENTS

Beach & Company

Phone 258—P. O. Box 574

131 E. Eighth St., Leadville, Colo.

Branches at Amarillo and Dumas, Texas.
All Utah smelters and other places by
arrangement. Address all communica-
tions to the Leadville office. Oldest,
most reliable.

Rates reasonable.

SHIPPERS' REPRESENTATIVES

at Tacoma Smelter for over 35 years
Control and Umpire Assaying

BENNETTS

Chemical Laboratory, Inc.

1131 Market Street • Tacoma 3, Wash.

THE COLORADO ASSAYING CO.

ASSAYERS, CHEMISTS, and
SPECTROGRAPHERS

Est. 1900

Charges: Gold 75c. Silver 75c. Copper 75c. Send
for Free Copy of Our Mineralogist's Pocket
Reference Giving Detailed Information on All
the Principal Ores.

2013 WELTON ST., DENVER 1, COLORADO

CUSTOM ASSAY OFFICE and LABORATORY

Commercial and Umpire Assayers
All types of organic and inorganic
chemical analysis
Shippers Representatives

105 South Santa Fe, El Paso, Texas
Post Office Box 811 Phone 2-2212

EL PASO TESTING LABORATORIES

Umpire Assayers—Chemists—Metallurgists
Shippers' Representatives

At:

El Paso Smelter—Phelps Dodge Refinery
For Ores and Scrap Metals

P. O. Box 1565, El Paso, Texas

EISENHAEUER LABORATORIES

ESTABLISHED 1916

320-322 South San Pedro St. • Los Angeles 13, Cal.
L. E. Raymond • Ed. Eisenhauer, Jr. • L. C. Penhoel

Assays • Chemists • Metallurgists
Ore Tests • Plants Designed

Specialty, Improvement of Plant Recovery & Efficiency

GOODALL BROTHERS

ASSAYERS AND CHEMISTS
SHIPPERS' REPRESENTATIVES
Established 1909

Helena

Montana

Continued from Page 19

cap and ball pistol at his feet. The Englishman leaped up and every time he jumped someone hit the floor with another shot which kept him hopping like a jack rabbit until he was worn out. Then the men set him up to a round of drinks, slapped him on the back and called him a regular fellow.

Today, Platoro is enjoying a new boom, but it is sports and construction, not mining, that attract people to it. Several cabin camps cater to skiers in the winter and to fishermen in the summer. The town is alive, with new cabins going up and old ones being reopened or remodeled. One part of the camp is full of quonset huts; a lodge provides meals for transients, and the U. S. Recla-

mation Bureau has offices in one of the largest buildings. The Reclamation Bureau's project is what has changed Platoro completely from a sleepy mountain town to one buzzing with activity. Automobiles bounce through its muddy streets; bulldozers cut away a hillside above the place and trucks drone up a steep, new road past the Forest King mine, carrying earthfill to a damsite just beyond.

The Platoro Dam, scheduled to be completed in 1952, is being constructed by the Bureau of Reclamation to provide a storage reservoir for the southern part of the San Luis valley. The dam will be 135 feet high and will cost \$4,200,000. It is an earth-filled structure built across the mouth of a narrow canyon, through which

runs the Conejos River. It will impound waters from the ten-foot annual snowfall which collects along the eastern slope of the Rockies in southern Colorado and will create a lake four and a half miles long with a capacity of 60,000 acre feet. This body of water will supply supplemental water to 91,000 acres of pasture and farm land in the San Luis valley. The dam will raise the surface of the river to 10,034 feet above sea level and will produce what is believed to be the largest man-made lake at that altitude.

Platoro, like so many other camps, has come back, but the old-timers still look nostalgically at the mines and think confidently of the ore which is in them. The next boom, they say, will be the real thing.

HANKS, INC., ABBOT A.

ASSAYERS AND CHEMISTS
Supervision of Sampling at Smelters
Spectrographic Analysis

624 Sacramento St. San Francisco 11

HAWLEY & HAWLEY

W. E. HAWLEY, Mgr.

Assayers, Chemists, Ore Buyers
Shippers' Representative

P. O. Box 1060 Douglas, Arizona

HERMAN, JOHN

ASSAYER AND CHEMIST

Qualitative Spectrographic Analysis
I Do Not Guarantee Satisfaction
I Guarantee Accuracy

920 Santee St. Los Angeles 15, Calif.

New Mexico MINERALS LABORATORY

A. K. Veeder, Mgr.
Central and Empire Assayers
Shippers' Representatives

1303 Grant Street Silver City, N. M.

SMITH-EMERY COMPANY

Established 1910

Assayers—Chemists
Metallurgists
Spectrographers
Shippers' Representatives

920 Santee Street Los Angeles, Calif.

Member
American Council of Commercial Laboratories

W. H. STOWELL & CO.

Chemists and Assayers
421 Sprague Ave. Spokane, Wash.
Estb. 1890

WOOD ASSAYING CO., HENRY E.

Established 1878
ASSAYERS and CHEMISTS
2042 Broadway Denver 2, Colorado

ROOT & SIMPSON, INC.
Metallurgical Chemists and Assayers
P. O. Box 2069 Denver 1, Colo.
Established 1902

Products and Supplies:


Flotation Reagents

BEAR BRAND XANTHATES
SUNNY SOUTH D. D. PINE OIL-A

Complete line of all standard flotation reagents, also metallurgical and assay chemicals carried in stock.

H. J. BARON COMPANY

805 Mills Building
EL PASO TEXAS



Laucks Laboratories'
"185
MINERALS
and
HOW TO
IDENTIFY THEM"
is the best guide obtainable.
50¢
Per Copy
1008 Western Ave. • Seattle



SEAL-TITE
TAMPING
BAGS
Save Time
and Money
in handling
Dummies
High wet strength and toughness withstand humidity and hard handling. Supplies of dummies are made up quickly and can be stored underground under wet conditions. Send for samples.
Tamping Bag Co. Inc.
210 S. THIRD ST.
MT. VERNON, ILL.

PLACER DREDGES

Dragline fed floating, dryland and suction placer dredges. Portable placer test machines. Also manufacture Universal compressed air mine locomotives.

UNIVERSAL DREDGE MFG. CO.
124 Wazee Market Denver 4, Colorado

VAN WATERS & ROGERS INC.

Flotation Chemicals • Mining Reagents
Largest and Most Complete Stocks
in Northwest
Seattle, Spokane, Portland, Boise

Drilling Companies:

ACME DRILLING SERVICE

Ore, Gravel and Water Prospecting
Keystone Churn and
Diamond Core Drilling
Surface and Underground

832 Cleveland St. Oakland 6, Calif.

DIAMOND DRILL

Contracting Company

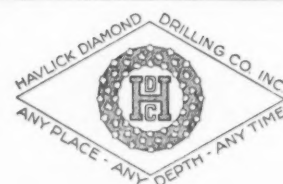
S. 18 Stone Spokane 15, Wash.

"DIA-HARD" CORE
BARRELS

AND

DIAMOND DRILLING SUPPLIES

Core and Churn Drill Contractors



CORE & BLAST HOLE CONTRACTOR
1509 W 2ND AVE., SPOKANE 9, WASH.

THE MARKET PLACE

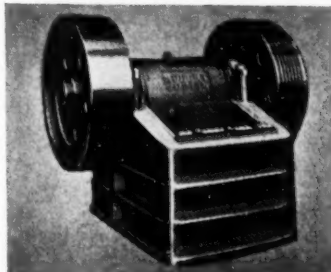
MINING AND MILLING MACHINERY ELECTRICAL, INDUSTRIAL and CONSTRUCTION EQUIPMENT

BLOWERS

- 1—#5 Spencer Turbine Blower driven by 3 HP motor
- 1—#5E Buffalo Exhauster driven by Carling turbine
- 1—#6E Buffalo Exhauster driven by 15 HP motor
- 1—#7 American "Sirrocco" Exhauster
- 1—#80 Acme Type "AE" Material-Handling Blower
- 3—#250 D.F.C. Furnace Blowers
- 1—North American 825 CFM Furnace Blower driven by 7 1/2 HP motor
- 1—#6 Buffalo Steel Pressure Blowers, turbine driven
- 2—#10 Buffalo Pressure Blowers
- 1—5" x 2 0" Rotary Positive Pressure Blower
- 1—6 1/2" x 22 1/4" Roots Rotary Positive Pressure Blower
- 1—8 1/2" x 29 1/4" Roots Rotary Positive Pressure Blower
- 1—10" x 18" Sutorbilt New Rotary Positive Pressure Blower
- 1—24" x 78" Roots #7 Rotary Positive Pressure Blower
- 1—#50 American Steel Plate Blower
- 1—#60 American "Sirrocco" Steel Plate Exhauster
- 1—#6 Sturtevant Volume Blower
- 1—#250 Type SM Coppus-Vano Blower driven by 3-hp. motor.
- 1—#4 Type T Coppus "Ventair" Blower
- 1—#8 Buffalo Volume Blower
- 4—#21 Type F. U. S. Volume Blowers
- 4—#24-SR Mueller New Volume Blowers
- 15—Type HS New American Volume Blowers 12,000 CFM driven by 12 1/2-hp. motors

CLASSIFIERS

- 1—48" x 18" Dorr Duplex Classifier
- 1—48" x 21 1/2" Akina Simplex Screw Classifier, heavy duty, double pitch, high weir
- 3—"St. Joe" Type Hydraulic 10-Cell Classifiers



JAW CRUSHERS

- 2—8" x 8" Universal #2
- 1—8" x 24" Rogers, cast steel
- 1—8" x 36" Universal, all steel
- 1—15" x 28" Pacific, all steel
- 1—9" x 15" Farrell Blake
- 1—9" x 36" Cedar Rapids
- 1—13" x 24" TelSmith

SAND PUMPS

- 1—1" Wilfley sand pump
- 4—2" Wilfley sand pumps
- 1—2" Denver vertical sand pump
- 1—3" x 3" Allen-Sherman-Hoff "Hydro-Seal" rubber lined
- 1—3" Telluride sand pump
- 2—4" Wilfley sand pumps
- 1—4" x 4" Allen-Sherman-Hoff "Hydro-Seal"
- 1—4" Denver vertical sand pump
- 2—6" Wilfley sand pumps

LOCOMOTIVES

- 1—1 1/2-ton Mancha "Little Trammer" Battery Locomotive

- 2—2 to 2 1/4-ton Mancha Battery Locomotives, 18" gauge
- 1—2 1/4-ton Whitcomb Battery Locomotive, 24" gauge
- 2—5-ton Westinghouse Battery Locomotives, 24"-36" gauge
- 2—7-ton General Electric Battery Locomotives, 36" gauge
- 2—8-ton General Electric Battery Locomotives, 36" gauge
- 4—10-ton Atlas Battery Locomotives, 36" gauge
- 1—3-ton Ruth Gasoline Locomotive, 18" gauge
- 1—3-ton Whitcomb Gasoline Locomotive, 24" gauge
- 3—6 1/2-ton General Electric Trolley Locomotives, 36" gauge
- 1—6 Ton Goodman Trolley Locomotive

TUGGER HOISTS

- 1—Dillon-Box #3, 1,000# air tugger
- 2—Gardner-Denver Model HB air tugger
- 1—Ingersoll-Rand, size EU, air tugger
- 2—Ingersoll-Rand, 2 drum, Model A-4NN-OJ air tuggers
- 1—Ingersoll-Rand, Model 6HC, air tugger
- 1—Ingersoll-Rand, 2 drum, size 5NH-OH electric tugger
- 2—Sullivan, class RH electric tuggers
- 1—Ingersoll-Rand, size 107, electric tugger
- 1—Sullivan, Model B-211, 2 drum, electric tugger
- 3—7 1/2 HP Sullivan electric tuggers
- 9—7 1/2 HP Sullivan double drum electric tuggers

BALL AND ROD MILLS

- 1—20" x 24" new Morse Bros. Batch Ball Mill
- 1—4" x 4" Standard Ball Mill
- 2—No. 64 1/2" Marcy Ball Mills
- 1—6" x 8" Marcy Ball Mill
- 2—8" x 22" Hardinge Conical Pebble Mills
- 1—3" x 8" Dewco Tube Mill
- 2—6" x 36" Hardinge Conical Ball Mills

Extensive stock of fully reconditioned machinery. Send for bulletin 501-M.

MORSE BROS. MACHINERY CO.
2900 BRIGHTON BLVD. • DENVER, COLORADO • ESTABLISHED 1898

TECHNICAL BOOKS

Send order to: MINING WORLD
121 Second Street, San Francisco 5, Calif.

- Economics for Engineers—by Bower & Rountree 4.50
- Scott's Standard Methods of Chemical Analysis—by Scott (Set of two books) 20.00
- Igneous Rocks and Depths of The Earth—by Daly 6.00
- Non-Ferrous Production Metallurgy—by Bray 6.00
- Air Compressors—by Feller 5.00
- Technical Methods of Analysis—by Griffin 8.50
- An Introduction to Metallurgy—by Newton 5.50
- Economic Mineral Deposits—by Bateman 7.50
- Engineering Metallurgy—by Stroughton & Butts 4.50

All books available for immediate delivery

MINING WORLD

FEDERAL PIPE & TANK CO.

—WOOD PIPE and WOOD TANKS—
Factory and Main Office
6851 E. Marginal Way
Seattle 8, Wash.

MINING WORLD

with which is combined

MINING JOURNAL

The Production Magazine of the Metal Mining Industry

Published at

SAN FRANCISCO, CALIFORNIA

\$3.00 Per Year 13 Issues

(Includes Mine Development and Directory Number)

GOOD AS NEW SURPLUS EQUIPMENT

- 1—Traylor Rod Mill, 3' x 10' Full Charge Rods
- 1—2' x 22' Simplex Classifier Rake
- 1—Set V Belts for Mill with Pulley
- 1—D. E. Co. Duplex jig, 12" x 12"
- 1—D. E. Co. 4 Cell Flotation Unit, 24" x 24", with Launder
- 1—D. E. Co. Dry Reagent Feeder
- 2—D. E. Co. Wet Reagent Feeders
- 2—Standard size Wilfley Tables
- 5—Gibson Amalgamators, 250-ton capacity, 2 head motions
- 1—6' x 22' Dorr Duplex Rake Classifier

IMMEDIATE DELIVERY

DR. R. S. PERSHING

Box 1657 • Phone 5361 • Lubbock, Texas

FOR SALE

Hillman Airplane Drill, complete, with tools, mounted on trailer, \$800

410 Twenty-second St. Merced, Calif.

Immediate Delivery—Two AC HD-19 Tractors, one with PC unit, canopy and blade, \$14,000.00; other with PC unit, canopy, no blade, \$12,500.00. Both, \$25,000.00.

EDWARD EHRBAR, INC.

29 Meserole Ave., Brooklyn 22, N. Y.
EV 3-5000

THE MARKET PLACE

RECONDITIONED AND GUARANTEED MINING AND MILLING MACHINERY

HOISTS

- 1—3-Drum I.R. Slusher, with built-in 50 HP AC Motor
- 1—#21 1/2 Vulcan Single Drum, direct geared to a U-6 International Gas. Power Unit
- 1—#6 1/2 Vulcan, single drum
- 1—Box Iron Works Single Drum, direct geared to a 15 HP Slip-ring Motor
- 1—H&B Single Drum Converted, direct geared to a 25 HP Slip-ring Motor
- 1—Crow Converted Single Drum Friction, direct geared to a 7 1/2 HP Slip-ring Motor

CLASSIFIERS

- 1—6' x 22' Dorr Type Duplex Rake Classifier
- 1—60" x 23' Denver Equipment, Simplex Crossflow Classifier

FILTERS

- 1—4", 6-disc Eimco, with vacuum equipment, new sectors and sector bags

BELT CONVEYORS

- 1—24" x 5' 6" Belt Feeder with Mag. Pulley & Charger
- 1—30", 40' or 70' Centers, motorized
- 1—42", 20' Centers, motorized

THICKENERS — AGITATORS CONDITIONERS

- 1—16' x 10' Dorr Thickener—wood tank—steel superstructure; complete with motor and diap. pump
- 1—6' x 5' Conditioner—steel tank—motorized
- 2—10' x 9' Deveraux Type Center Well Agitators—wood tanks—motorized
- 5—Steel A Frames, complete with 15 HP Vertical Motors—no tanks

DIESEL GENERATORS

- 1—D-4400 Caterpillar V-belted to a 30 KVA 220 Volt Fairbanks-Morse AC Generator, complete with switchboard

PUMPS—SAND

- 1—2" Split Case Wilfley Pump—rubber lined—motorized
- 3—2" Wilfley Pumps—solid bowls—rubber lined—motorized
- 4—2" Wilfley Pumps—motorized

BATTERY LOCOMOTIVES

- 2—Ironton Locos. 6000# Chassis, 36" ga. complete with Exide Batteries and Charger

FLOTATION MACHINES

- 2—No. 24 Denver "Sub-A" with wood tanks, rubber impellers

WAGON DRILLS

- 1—Sullivan #LW-6 on steel wheels, with drifter, etc.
- 1—Ingersoll-Rand on pneumatic tires, with drifter, etc.

MISCELLANEOUS

- 1—10' x 10' Jack-leg Steel Bin
- 1—12" x 30" Jeffrey-Traylor Vibrator Feeder, 220 volts AC
- 25 tons 85# Relaying Rail
- 50 tons 60# Relaying Rail
- 1—3' x 3' Ball Mill
- 1—10 x 12 Gardner Horizontal Air Compressor with 50 HP AC Motor
- 1—36" x 8' Air Receiver
- 1—42" x 10' Air Receiver
- 5—Roller Bearing Ore Cars
- Insulated Copper Wiring
- Several hundred ft. #6—2 conductor Tyrex Cable

WRITE FOR BULLETIN NO. 10

FLORENCE MACHINERY & SUPPLY COMPANY

Suite 904 Equitable Bldg.

C. J. PARRISH, Manager

Denver 2, Colorado

ALLISON STEEL MANUFACTURING COMPANY

Mine and Mill Buildings • Mine
Rails • Ore Cars • Steel
Gallows Frames • Ball Mills
Muck Plates • Crucible Drill
Steel

• We offer a complete repair
service to the Mining Indus-
try. Our new Machine Shop is
equipped to handle your work
quickly and economically.

*Hot Milling of All Types of
Detachable Bits*

SOUTH 19th AVENUE
PHOENIX ARIZONA
PHONE 3-5161

FOR SALE OR RENT

Heavy Equipment now at
Cushman, Arkansas

READY TO DRIVE OFF

LIMA #1201 Shovel, 2 1/2 yd. bucket, 40
ft. boom, 32 ft. dipper stick, Cummins
diesel motor, PMCA bucket, Koehler
light plant.

BUCYRUS-ERIE 44B shovel, 2 yd. bucket,
Buda diesel motor, Koehler light plant.

LIMA #801 Dragline, Paige 2 1/4 yd.
bucket, Buda diesel motor, 80 ft. boom,
Koehler light plant.

RONE motor grader model 404, Oliver
transmission.

STANDARD MINING CORP.

Batesville, Arkansas, Ph. 320 day, 352 night

NEW AND UNUSED

To Be Sold as a Pair

- 1—4" Morris Centrifugal Gravel Pump with
25 hp. International Diesel, Oak Skid
Mounted.
- 1—6" Morris Centrifugal Gravel Pump with
12 D Sheppard Diesel, Oak Skid
mounted.

For Information Write:

F. A. FRANK, Jr.
Box 542, South Houston, Texas

- 4—Ball Mills 6' x 6', Grate Discharge.

- 3—60" Akins Simplex High Weir Classifiers.

- 2—36" Akins Duplex-Submerged Spiral
(DDPS) Classifiers.

- 2—Morse Bros. 8 Disc, 8' 6" Dia. Filters.

- 8—Tyler Hummer Screens, 4x5 equipped
with V-16 and V-50 units.
Miscellaneous sizes Centrifugal Pumps.
Strong Scott Unipulso Coal Pulverizers:
1—#40; 3—#30; 1—#20.

- 1—Webb Corp.-Blake Type Jaw Crusher,
6' x 15"; Cast Iron.

New and Used Parts for 5 1/2" Symons
Short Head Crusher.

Miscellaneous Electric Motors 50 H.P. to
350 H.P., 440 volts, 3 phase, 60 cycle;
125, 150 and 200 H.P., 2,200 volts, 3
phase, 60 cycles.

- 3—150KV-A Allis-Chalmers Transformers
Type CD; 60 cycle, single phase; volt-
age rating 23,000-2,300 (with voltage
taps); outdoor installation.

- 3—G. E. Transformers, Type H, Form D M,
60 cycles, single phase 833 KV-A Con-
tinuous—55° C Rise, Voltage Rating
23,000-2,300/4,000 V.

Complete list of all equipment
will be sent upon request.

GOLDEN CYCLE CORPORATION

P. O. BOX 86
COLORADO SPRINGS, COLORADO

THE MARKET PLACE

ALL MILLING EQUIPMENT AND SUPPLIES

PACIFIC BRIDGE PLANT—1,500 TON LEAD-ZINC FLOTATION

Several thousand feet Pipe
Complete, excellent. Assay Lab
Lab Flot. Cells—Pulverizers
Crushers—Screens—Muffle Furn.
Hardinge Ball Mill 8'x30"—Motor
Marcy 5'x10' Ball Mill and Motor
Sand Pumps—Wildley—Denver
8"—6"—4"—2"—1"
Nearly New Kewanee Boiler
Classifiers—Rake—Spiral
Compressor—Garage Type
6'x6' Steel Tank Conditioners
18" and 24" Conveyors
10'x20' Pacific Crusher
Crushing Rolls
Elevators (Bucket)
14.5 4-Cell Fag. Flot. Cells
8-Cell Sub-A Denver ±24 Flot. Cells
Heating Plant—Excellent Boiler
Heating Plants
500-KW Diesel Generator

Hydro-Classifier—14' Denver
Hydro-Classifier—16' S.W. Eng.
Balances—Gold—Pulp—Analytical
Lab Braun Pulverizers—Chipmunk
Crushers—Hot Plates
Hough Concentrate Loader
Pumps—280 Head—44u Motor, 96-gal.
Sand Pumps Spare Parts
Diaphragm Pumps—Simplex—Duplex
Reagent Feeders—Clarkson & Denver
Trommel Screens—Stephens-Adamson
30' Thickeners; also 20' Thickeners
50' Thickeners
Vacuum Pumps
Transformers—(3) 333 KVA—22000-440
Eimco Filters—6' dia. 6 & 7 Leaf
10-Cell Denver ±24 Flot. Cells
2-Cell Sub-A Denver ±18 Flot. Cells
Blowers
Compressors

WE ALSO OWN

1—86 Marcy Ball Mill
4—30'x22' Dorr Agitators
1—6'x4' Ball Mill
200—Mine Cars

5—45'x12' Dorr Thickeners
8' Bowl Classifier
13'x30' Crushers
12B Mucking Machine

Motors—Vibrators—Screens

Several Mine Hoists—Send your needs

TRY US WHEN YOU THINK OF EITHER BUYING OR SELLING

Exclusive sales agent for Pacific Bridge Company—See equipment at Park City, Utah. Plant
near Salt Lake—Plant on R.R. Spur and Black Top Hi-way

PHONE OR WRITE

ROGER PIERCE EQUIPMENT SALES CO.

808 Newhouse Building • 3-3973 • Salt Lake City, Utah

BUSINESS MEN'S CLEARING HOUSE

Established 1903

47 Years of Service to Employer and Employee
in the Technical Field
File Your Application with Us
No Registration Fee

| | |
|--|-----------------|
| Mill Foreman Metallurgist, ign. | \$5,000 |
| Miners (2), foreign | 270-350 |
| Assistant Mine Superintendent, ign. | 600 |
| Mine Chief Engineer, ign. | 500 |
| Mine Engr., ign., single, Span. | R & B & 300 |
| Mine Superintendent, ign. | R & B & 375 |
| Jr. Geologist, ign., Span. | R & B & 300-350 |
| Mine Shift Boss, single, young | R & B & 200 |
| Research Metallurgist, heavy sulphide flotation, single, young, ign. | 300 |
| Jr. Metallurgist, ore dressing lab., exp., ign. | 250 |
| Mine Engineer, U. S. | OPEN |
| Mine Foreman, ign., speak Spanish | 350 |
| Assayer, foreign, wet & fire, single | 350 |
| Exec. Secy.-Steno., Eng. & Span. | House & 350 |
| Shift Boss Pac. | R & B & 275 |
| Div. Mine Foreman, ign. | R & B & 350 |
| Architectural Draftsman, U. S. A. | 500-700 |
| Concentrator, Supt., exp'd copper flotation process, ign. | OPEN |
| Three Gen'l Shift Foremen, thorough exp. copper flotation methods, ign. | OPEN |
| Smelter Supt., exp'd reverb'y furnace operation, ign. | OPEN |
| Three Gen'l Smelter Foremen, thorough experience, ign. | OPEN |
| Gen'l Maintenance Supt., ign. | OPEN |

601 Midland Savings Bldg.
Denver 2, Colorado

GLENN B. WILSON

Employment Specialists

| | |
|--|-------------------------|
| CHIEF MECH. ENGR. | \$12,000-\$15,000 |
| LEAD SMELTER SUPT., ign. | OPEN |
| MINE PHYSICIAN-surgeon, young | to \$12,000 |
| DESIGNERS, mech. struc. | U. S. \$425, ign. \$500 |
| DRAFTSMEN, struc. mech. (2) | \$350 |
| MINE SUPTS. (2), ign. | \$600 & \$1,000 |
| ASST. MINE SUPTS. (2), ign. | \$485 |
| MINE FOREMEN (4), E. M., ign. | \$330-\$400 |
| METALLURGIST, elect. smelting | \$600 |
| JR. MINE ENGRS. (3), U. S. | \$250-\$325 |
| ASST. ENGRS. (2), C. E. or E. M. | start \$264 |
| METALLURGIST, mill foreman, ign. | \$5,000 |
| METALLURGISTS, ign. (2), smelter (1) | \$400 |
| METALLURGIST, grad., ign. | \$300 |
| CYANIDE FLOT. shifters, ign. | \$275-\$365 |
| REFINERY F'MAN, electrolytic | \$400 |
| ANALYTICAL CHEMISTS, ign. \$300, U. S. to \$380 | |
| ASSAYER-CHEMIST (2), ign. | \$315 & \$350 |
| CIVIL ENGR., R.R. exp., ign. | OPEN |
| MASTER MECH., mine, ign. | \$475 |
| ELECT. FOREMAN, E. E., ign. | \$400 |
| ELECT. OFFICE ENGR., E. E., ign. | \$350 |
| ELECT. ENGR., power plant | OPEN |
| MINE ELECTRICIAN, ign. (2) | \$290 & \$400 |
| MINE WAREHOUSE, ign. | \$400 |
| EXEC. STENO.-SECY., both Eng., Span., age 35-45, ign. | house and \$350 |
| TRAVELING AUDITOR, mine | \$5,000 |
| ACCOUNTANT, office mgr. | \$5,000 |

GLENN B. WILSON

Employment Specialists

306 Continental Oil Building
DENVER 2, COLORADO

MINING & MILLING MACHINERY

LOADERS

- 6—Eimco 12 B rocker shovels,
18" or 24" gauge \$1,000 to \$1,500
- 2—Sullivan rocker shovels,
18" or 24" gauge 750 to 1,250
- 1949 Cat. D 6 streamliner—Trancavator
1 1/2 yard bucket, 10' blade. Used 87
hrs. Present cost \$15,500. Our price \$8,500

POWER UNITS

- 2—Waukesha 60 H.P. (actual) gasoline
or propane, complete with starter,
clutch, radiator, either flat belt or
V-drive. Perfect. Each 695
- 1—Buda (new) 60 H.P., complete (40%
off new) 995
- 1—Atlas Imperial Diesel, 125 H.P. 1,995
- 4—Ford or Mercury Power Units, 27
H.P., complete 425
- 1—Allis-Chalmers 50 H.P., complete 595

PULLEYS & DRIVES—USED

Split steel—all sizes—cheap.
V-drive pulleys—all sizes.
V-belts—all sizes—used.

ELECTRIC MOTORS—USED

All sizes from \$5 to \$10 per H.P.

PIPE—USED

- Extra good 2 1/4-inch seamless steel tub-
ing—40-foot lengths, approximately
8,000 feet, per foot .20
- Extra good 4-inch seamless steel tubing—
40-foot lengths, approximately 25,000
feet, per foot .65

ELECTRIC PLANTS

- 1—50 KVA 110-220 60 cycle 3 phase AC
or DC portable generator complete
with panel—direct connected to 100
H.P. Buda full diesel engine. Like
new. This unit lists at \$11,000. Our
price 3,500
- 1—10 KVA 110-220 60 cycle 3 phase AC
or DC portable generator complete
with panel. V-belt connected to either
Waukesha or Buda engine 2,250

PORTABLE AIR COMPRESSORS

- Late model Schramm 115 CFM portable on
pneumatic tires, electric starters—
like new. These are exceptional. Priced
from 2,500 to 3,750
- 1—Late model LeRoi 60 C.F.M., like new,
price 695
- 2—Schramm—Old model 105 C.F.M., fair
condition, each 495

PUMPS

- 50—Pomona turbine pumps, all sizes, bowl
assemblies, vertical motors to 150 H.P.
- 15—Split case centrifugal pumps, all sizes. New
condition. One-half price of new pumps.
- 10—Contractors' pumps—all popular sizes. Will
rent to responsible operators.
- Special bargains in new Worthington tur-
bine pumps for settings under 90
feet—400 GPM. Complete pump \$ 995

HOISTS

- 10—Band friction and pin friction rigs,
priced from 150 to 500
- 1—New 50 H.P. Ingersoll-Rand 3-drum
slusher hoist—end controls 3,500

SPECIALS

- 1—9-yard bottom dump heavy steel 4-
wheel trailer (Miss. Wagon), perfect
tires—1 year old. List price \$6,250.
Our price 2,250
- For economical rock haulage. Pneum-
atic rock grip tires like new.
- 1—Set McKinnick Safety Blocks, Fig.
2504, size 28 x 17. List price \$650.
Our price 250
- Scrapers (for slusher hoists), 42" and
48", NEW, with detachable blade,
each 100
- Denver sub A Flotation steel machine—
10 cell. Less motors. Price 750
- 1—Filter—American 6"—2-leaf with
vacuum machine 1,500

ROLLS

- 24", 30", 36" rolls, complete with good
shells. Priced from 250 to 500
- 14" rolls, complete 2,000
- 66" rolls, complete 2,500

JAW CRUSHERS

- 24" jaw crushers 1,500
- 30" jaw crushers 2,500
- Other machinery and equipment too numerous
to mention. If we don't have it—we'll find it for
you—and at the right price.

All Prices F.O.B. Joplin, Missouri

JOPLIN MACHINERY & ELECTRIC COMPANY

420 School Street Telephone 1500
Joplin, Missouri

INDEX OF ADVERTISERS

| | | |
|---|--|---|
| Acme Drilling Service..... 76 | Euclid Road Machinery Co. Inside Front Cover | Morse Bros. Machinery Co..... 55, 77 |
| Allis-Chalmers Mfg. Co. (General Machinery Division)..... 42 | Federal Pipe & Tank Co..... 77 | Murphy, F. M..... 75 |
| Allis-Chalmers Mfg. Co. (Tractor Co.)..... 46, 47 | Florence Machinery Co..... 78 | Pacific Foundry Co., Ltd..... 26 |
| Allison Steel Mfg. Co..... 78 | Frank, F. A..... 78 | Pacific Pipe Co..... 61 |
| Alloy Steel & Metals Co..... 1 | Gardner-Denver Co..... 52 | Pershing, R. S..... 77 |
| American Cyanamid Co..... 9 | Gilmore, R. L..... 75 | Pierce, Roger..... 49, 79 |
| American Potash & Chem. Corp..... 61 | Golden Cycle Corp..... 78 | Pittsburgh Leetrodryer Corp..... 31 |
| American Smelting & Refining Co. 7 | Goodall Brothers..... 75 | Resisto-Loy Company..... 18 |
| American Zinc, Lead & Smelting Co..... 14 | Goodall Rubber Co..... 18 | Root & Simpson, Inc..... 76 |
| Arizona Testing Laboratories..... 75 | Hammond-Everly Engineering Co. 75 | Sanford-Day Iron Works..... 2 |
| Atlas Powder Co..... 4 | Hanks, Inc., Abbott A..... 76 | Scholla, Paul F..... 75 |
| Baron Co., H. J..... 76 | Hardinge Co..... 51 | Smith-Emery Co..... 76 |
| Beach & Company..... 75 | Havlicek Diamond Drilling Co., Inc. 76 | Smith Engineering Works..... 6 |
| Bemis Bro. Bag Co..... 55 | Hawley & Hawley..... 76 | Standard Mining Corp..... 78 |
| Bennetts Chemical Laboratory, Inc. 75 | Herman, John..... 76 | Standard Oil Co..... 54 |
| Black & Deason..... 75 | Hewitt-Robins, Inc..... 68, 69 | Stearns Magnetic Mfg. Co..... 64 |
| Boyles Bros. Drilling Co..... 71 | Hyster Co..... 57 | Stearns-Roger Mfg. Co..... 66 |
| Bucyrus-Erie Mfg. Co. Inside Back Cover | Industrial Air Products Co..... 73 | Stowell & Co., W. H..... 76 |
| Bunker Hill & Sullivan Mining & Concentrating Co..... 14 | International General Electric Co. Inside Back Cover (World Mining) | Tamping Bag Co..... 76 |
| Business Men's Clearing House..... 79 | International Harvester Co..... 50 | Terry, Joseph T..... 75 |
| Card Iron Works, C. S..... 59 | International Smelting & Refining Co..... 14 | Thomas, Sewell..... 75 |
| Caterpillar Tractor Company..... 32 | Johnson, Herbert Banks..... 75 | Timken Roller Bearing Co..... 48 |
| Collins, Glenville A..... 75 | Joplin Machinery Co..... 79 | Traylor Engineering Co..... 21 |
| Colorado Assaying Co..... 75 | Joy Manufacturing Co..... 22, 23 | Udy, Marvin..... 49 |
| Columbian Steel Tank Co..... 18 | Kasey, J. Bryant..... 75 | Ultra Violet Products, Inc..... 73 |
| Commins Engine Co..... 3 | Kingard, A. R..... 49 | Universal Dredge Mfg. Co..... 76 |
| Custom Assay Office & Laboratory..... 75 | Laucks Laboratories..... 76 | Van Waters & Rogers, Inc..... 76 |
| Deister Concentrator Co..... 58 | LeTourneau, Inc., R. G..... 24, 25 | Vulcan Iron Works..... 72 |
| Denver Equipment Co..... 40 | Link-Belt Co..... 48 (World Mining) | Walvoord Co., B. W..... 75 |
| Denver Fire Clay Co..... 59 | Lintz, Mark..... 75 | Wedge Wire Corp..... 73 |
| Diamond Drill Contracting Co..... 76 | Magma Copper Co..... 14 | Western Machinery Co..... 36 |
| Dodge, Theodore A..... 75 | McDaniel, G. G..... 75 | Westinghouse Electric International 54 (World Mining) |
| Dorr Co..... 44 | McFarland, H. F..... 49 | Wilfey, A. R., & Sons Outside Back Cover |
| Dow Chemical Co. (Great Western Division)..... 63 | McNeil, Clayton T..... 75 | Wilson, Clyde H..... 75 |
| Ehrbar, Inc..... 77 | Merrick Scale Mfg. Co..... 74 | Wilson, Glenn B..... 79 |
| Eimco Corp..... Outside Front Cover | Miller, Arnold H..... 75 | Wood Assaying Co., Henry E..... 76 |
| El Paso Testing Laboratories..... 75 | Mine & Smelter Supply Co..... 41 | Worthington Pump & Machinery Co..... 36 (World Mining) |
| Emeco Concrete Cutting Co..... 8 | Minerals Laboratory..... 76 | Wright, Lawrence B..... 75 |
| Eisenhauser Laboratories..... 75 | Moss, Stanley M..... 75 | Yuba Mfg. Co..... 55 |

Positions Desired

SALES ENGINEER. 10 years Industrial Sales, five years experience Hardrock miner, mill operator, lessor, small mine management. Acquainted Calif.-Nevada. Married, age 39. College background, travel. Excellent references. Reply Box M-1, MINING WORLD, 121 Second St., San Francisco 5, Calif.

ACCOUNTANT, CHIEF. California Employment. Thoroughly experienced in mine cost accounting, financial statements and consolidations. Please submit photo, personal history, education, experience, past employers and references. State minimum salary required to start. Reply Box A-1, MINING WORLD, 121 Second Street, San Francisco 5, Calif.

Business Opportunities

FOR SALE

Large group of developed lead-zinc mining property. Open for inspection.
P. O. Box 362 Denver, Colorado

Have large Copper-Gold-Silver Property partially developed and proven, near Humboldt, Arizona. Excellent Promising showings. Need responsible backing with inviting terms. Parties who qualify.

Temporary Address: 4448 Kraft Avenue
North Hollywood, California

FOR SALE—Six mining claims showing high grade cinnabar ore. 1,000-foot tunnel, fully equipped for operation, including retort. For further information: Hicks Real Estate Agency, 124 East Third Street, Prineville, Oregon.

Positions Available

REQUIRED FOR SOUTHWEST—Two experienced draftsmen for design and detailing wood and steel structures, foundations, reinforced concrete and other allied work. Pleasant working conditions. Pension and insurance benefits. Personal traveling expenses refunded. Apply by letter with full details, age, education, experience, etc., to American Smelting and Refining Company, 1112 Mills Building, El Paso, Texas.

Large mining company in South America presently designing metallurgical plant involving new electric smelting process desires employ at earliest date possible talented metallurgist with proven operating experience, preferably between 28 and 34 years old. Location New York for approximately one year during design phase, engaging in technological studies, observing practices in other plants using somewhat similar techniques, then to move to property during middle and end of construction period, with good prospect of ultimately supervising plant. Three-year contract, living allowance while on temporary duty in U. S. Unusually attractive opening for able and ambitious man wishing to enter new field offering great possibilities.

Also require services two younger men with metallurgical training to work closely with above man, eventually to become operating foremen.

Reply Box L-1, MINING WORLD, 121 Second St., San Francisco 5, Calif.

Equipment For Sale

REBUILT ball mills and diesel electric generator units. Will take part cash and part stock in mines now paying dividends. Le Bron, 314 So. 12th St., Omaha, Nebraska.

3864 Ft. New C.P. Electric Air Compressor. 5'x22", 6'x48" and 8'x22" Hardinge Ball Mills.
6'x14" Hardinge Counter Classifier.
432 KVA 2300 V. Worth. Diesel Gen.
4x10, 5x12 and 7x9 Rod Mills.
18x36, 24x36 and 42x48 Jaw Crushers.
54x24, 40x15 and 30x16 Crushing Rolls.
15 Eimco & Gardner-Denver Tunnel Shovels.
7'x16" Marcy Rod Mill.
Dings E3 Wetherill 6 pole, 18" belt, 3 stage high intensity Magnetic Separator
6'x60" Rotary Kila.
Oliver Continuous Filters 8'x12' 11'6" x 14'
8'x4' Dorco Continuous Filters.
8'6" x 6 disc American Filters.
1250 KVA Nordberg 2300 V. Diesel.
1092 Ft. Electric 114 Joy Compressor
DARIEN, 60 E. 42nd Street, New York, N. Y.

FOR SALE

The most modern PLACER SCREENING PLANT in the west. Includes the following equipment—all guaranteed first-class:

- 1—1-yd. Northwest with both DRAGLINE & SHOVEL attachments.
- 1—D8 Caterpillar BULLDOZER.
- 1—42" SCREENING PLANT: new, full electric with 25-kw generator; individual drives for trommel, conveyor stacker, water-pressure pump, and sand pump.
- 1—Large GMC BUS: built into office and living quarters; complete as is.
- 1—3/4-ton PICK-UP TRUCK.

TERMS TO RESPONSIBLE PARTIES

Box A2, MINING WORLD
121 Second Street San Francisco 5, Calif.

Miscellaneous

HAVE YOU A GRINDING PROBLEM?

Custom Milling of Minerals and Granular Products

CONTINENTAL MINERAL PROCESSING CORP.

Box 8 Sharonville, Ohio

Look

FOR THESE 4 POINTS IN BLAST HOLE DRILLS

BUCYRUS-ERIE blast hole drills satisfy every major need for fast, low-cost overburden drilling. Here's why.

1

FAST HOLE FOOTAGE With Bucyrus-Erie drills you not only get large diameter (5 $\frac{1}{8}$ -in. to 12-in.) holes, you get them fast. The right balance of tool travel distance, tool weight and blows per minute — combined with an unmatched rock shattering snap at the impact point — put these rigs "holes ahead" in penetration speed.

2

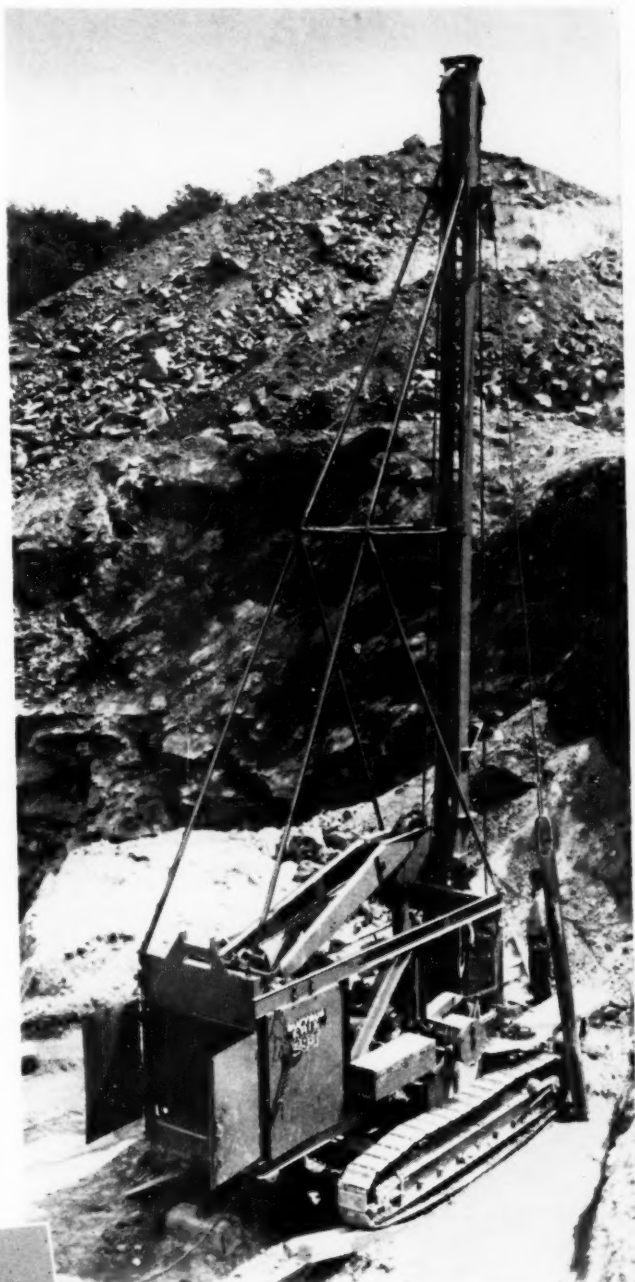
QUICK MOVES AND SET-UPS Big caterpillar mountings enable drills to move fast over rough surfaces and up steep grades, cutting between-hole travel time. Built-in stabilizing jacks provide quick, 3-point set-ups — without special ground preparation.

3

EASY OPERATION Control levers are grouped within close reach of operator and are easy to handle. A driller can run this rig at top speed for long periods without fatigue slow down. Built-in tool wrenches (on all except 22-T) safely speed tool changing.

4

LOW-COST MAINTENANCE Rigid box-frame rubber insulated sheaves, and derrick-head shock absorber protect machinery from vibration, reduce cable wear by keeping shock loads down. A Bucyrus-Erie "first," the rubber shock absorber is the most successful yet devised.



**Look
TO BUCYRUS-ERIES
FOR ALL FOUR**

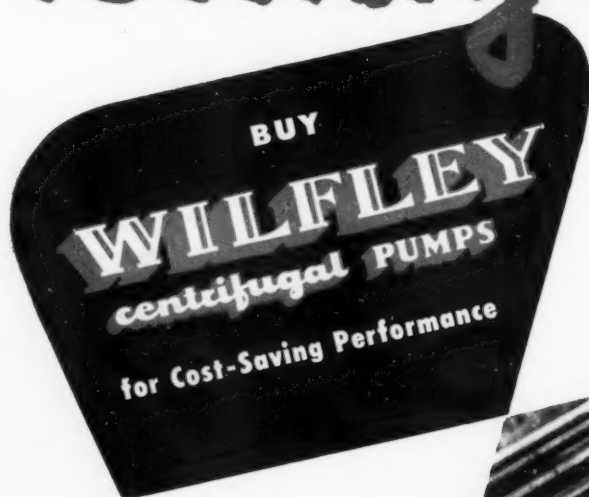
Equip your mine with the most modern blast hole drill available — Bucyrus-Erie. Four Models — hole capacities from 5 $\frac{1}{8}$ to 12-in.

39851

**BUCYRUS
ERIE**

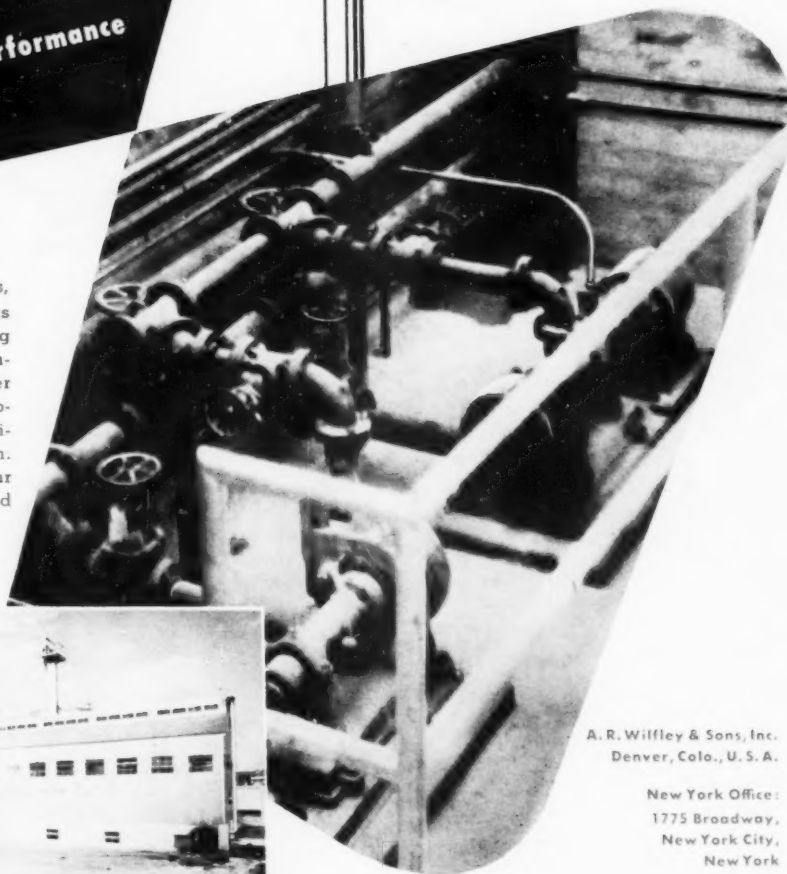
SOUTH MILWAUKEE, WISCONSIN

for carbonate *sludge*



Wilfley Pumps deliver continuous, trouble-free, low-cost performance plus worthwhile power savings in handling sands, slurries or slimes. Complete interchangeability of parts—from rubber to metal, or metal to rubber. An economical size for every purpose. Individual engineering on every application. Write or wire for complete details of our new MODEL "K" pumps—engineered for greater pumping economy.

Wilfley Centrifugal Pumps are at work in the City of Miami rotary kiln plant disposing of sludge formed in softening water. The 50 per cent solid calcium carbonate sludge from the wash mill is carried to the thickener tanks and the 20.3 per cent thickener underflow is pumped up to a slurry feeder on the top floor of the kiln feed building. Dependable Wilfley pumps deliver the uniform product necessary for high efficiency operation.



A. R. Wilfley & Sons, Inc.
Denver, Colo., U. S. A.

New York Office:
1775 Broadway,
New York City,
New York

COMPANION TO THE FAMOUS WILFLEY ACID PUMP